S8228

Version 1.00

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Before you begin…

Check the box contents!

The retail motherboard package should contain the following:

	1x S8228 Motherboard
	1 x S8228 User's manual
	1 x S8228 Quick reference guide
	1 x TYAN® Driver CD

Chapter 1: Instruction

1.1 - Congratulations

You have purchased one of the most powerful server solutions. Based on the AMD® Opteron SR5650 & SP5100 chipset, The TYAN® S8228 series motherboard is designed to support 2 AMD® Opteron™ 4000 series processor and up to 96GB of 667, 800, 1066 and 1333 MHz R/U DDRIII memory. There are also 4 channels with 12 DDRIII DIMMs, providing a rich feature set and incredible performance. Leveraging the advanced technology from AMD®, the TYAN® S8228 series is capable of offering a scalable 32 and 64-bit computing environment with high-bandwidth memory design and lightning-fast PCI-E Gen2 bus implementation.
The S8228 not only empowers you in today's demanding IT environment but also offers a smooth path for future application upgradeability. All of these rich feature sets provides the S8228 with the power and flexibility to meet demanding requirements for today's IT environments.

The TYAN S8228 series is designed around several different configurations which are detailed in the following 1.2 Hardware Specification section:

1.2 - Hardware Specifications

TYAN S8228(S8228GM3NR)

Processor	**Supported CPU Series**	AMD 45nm 4-Core/6-Core Opteron 4100 Series Processors (Lisbon)
	Socket Type / Qty	C32 / (2)
	Average CPU Power (ACP) wattage	Up to 95W
	System Bus	Up to 6.4 GT/s Hyper-Transport link support
Chipset	**Chipset**	AMD SR5650 + SP5100
	Super I/O	Winbond W83627
Memory	**Supported DIMM Qty**	(6)+(6) DIMM slots
	DIMM Type / Speed	U/RDDR3 & LV RDDR3, 800/1066/1333 MHz
	Capacity	Up to 96GB
	Memory channel	2 Channels per CPU
	Memory voltage	1.5V or 1.35V
Expansion Slots	**PCI-E**	(1) PCI-E Gen.2 x16 slot
	Recommended TYAN Riser Card	M7018-R16-1L, 1U PCI-E x16 riser card (right)

Recommended Barebones / Chassis	**1U Barebones**		YR190-B8228-X2
LAN	**Port Qty**		(3)
	Controller		Intel 82574L / Intel 82576EB
Storage	**SATA**	**Connector**	(4) SATA
		Controller	AMD SP5100
		Speed	3.0 Gb/s
		RAID	RAID 0/1/10/5 (Promise Integrated RAID)
Graphic	**Connector type**		D-Sub 15-pin
	Resolution		1600x1200@60Hz
	Chipset		Aspeed AST2050
Input /Output	**USB**		(5) USB2.0 ports (2 at rear, 2 via cable, 1 type A onboard)
	COM		(1) ports (1 at rear)
	VGA		(1) D-Sub 15-pin VGA port
	RJ-45		Total (3) GbE ports, (1) shared with IPMI
	Power		**Proprietary** 20-pin (12V single input) power connector **Note:** Recommend YR190-B8228-X2
	Front Panel		(1) 2x12-pin SSI front panel header
	SATA		(4) SATA-II connectors
System Monitoring	**Chipset**		Winbond W83795G
	Voltage		Monitors voltage for CPU, memory, chipset & power supply
	Fan		Total (3) 8-pin headers
	Temperature		Monitors temperature for CPU & system environment
	LED		Fan fail LED indicator / Over temperature warning indicator / Fan & PSU fail LED indicator
	Others		Chassis intrusion detection
Server Management	**Onboard Chipset**		Onboard Aspeed AST2050
	AST2050 IPMI Feature		IPMI 2.0 compliant baseboard management controller (BMC) / USB 2.0 virtual hub / BIOS update
	AST2050 iKVM Feature		24-bit high quality video compression / Dual 10/100 Mb/s MAC interfaces
BIOS	**Brand / ROM size**		AMI / 4MB
	Feature		Plug and Play (PnP) /PCI2.3 /WfM2.0 /SMBIOS2.3 /PXE boot / ACPI 3.0 power management /Power on mode after power recovery / User-configurable H/W monitoring / Auto-configurable of hard disk types
Physical Dimension	**Form Factor**		Proprietary
	Board Dimension		6.3"x16.4" (160.02x416.56mm)

Operating System	**OS supported list**	**http://www.tyan.com/index.aspx**
Regulation	**FCC (DoC)**	Class B
	CE (DoC)	Yes
Operating Environment	**Operating Temp.**	10° C ~ 35° C (50° F~ 95° F)
	Non-operating Temp.	- 40° C ~ 70° C (-40° F ~ 158° F)
	In/Non-operating Humidity	90%, non-condensing at 35° C
RoHS	**RoHS 6/6 Complaint**	Yes
Package Contains	**Motherboard**	(1) S8228 Motherboard
	Manual	(1) Quick Ref. Guide in bulk packing carton
	Installation CD	(1) TYAN installation CD in bulk packing carton

Instructions and images within this manual are represented S8228. For different SKUs some variations in detail are possible.

Remember to visit the TYAN® Website at **http://www.TYAN.com**. There you can find information on all of the TYAN® products, FAQs, online manuals, BIOS upgrades and more.

1.3 - Software Specifications

For OS (operation system) support, please check the TYAN® website for the latest information.

1.4 - AST2050 User Guide

Remember to visit the TYAN® Website at **http://www.TYAN.com** for the latest AST2050 user guide.

Chapter 2: Board Installation

You are now ready to install your motherboard.

How to install our products right… the first time

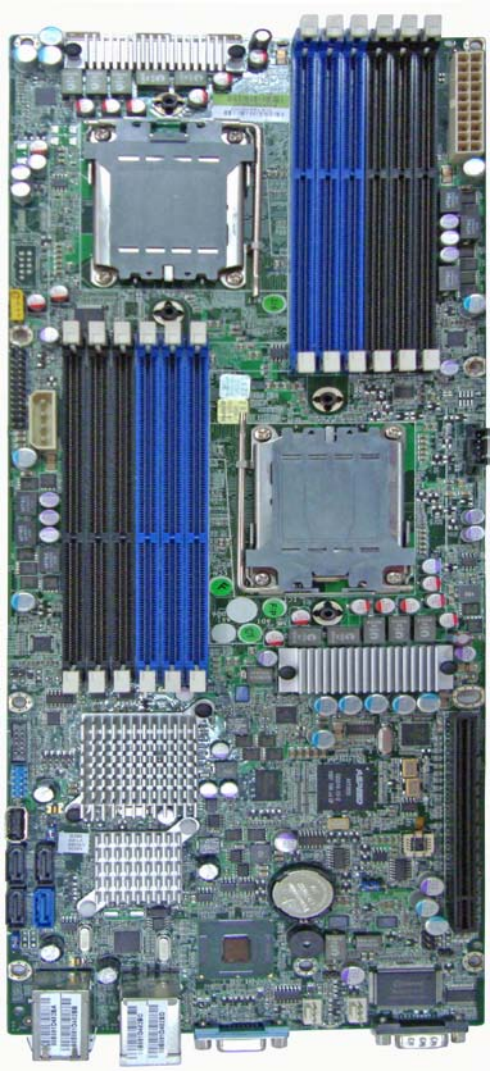
The first thing you should do is reading this user's manual. It contains important information that will make configuration and setup much easier. Here are some precautions you should take when installing your motherboard:

(1) Ground yourself properly before removing your motherboard from the antistatic bag. Unplug the power from your computer power supply and then touch a safely grounded object to release static charge (i.e. power supply case). For the safest conditions, TYAN® recommends wearing a static safety wrist strap.
(2) Hold the motherboard by its edges and do not touch the bottom of the board, or flex the board in any way.
(3) Avoid touching the motherboard components, IC chips, connectors, memory modules, and leads.
(4) Place the motherboard on a grounded antistatic surface or on the antistatic bag that the board was shipped in.
(5) Inspect the board for damage.

The following pages include details on how to install your motherboard into your chassis, as well as installing the processor, memory, disk drives and cables.

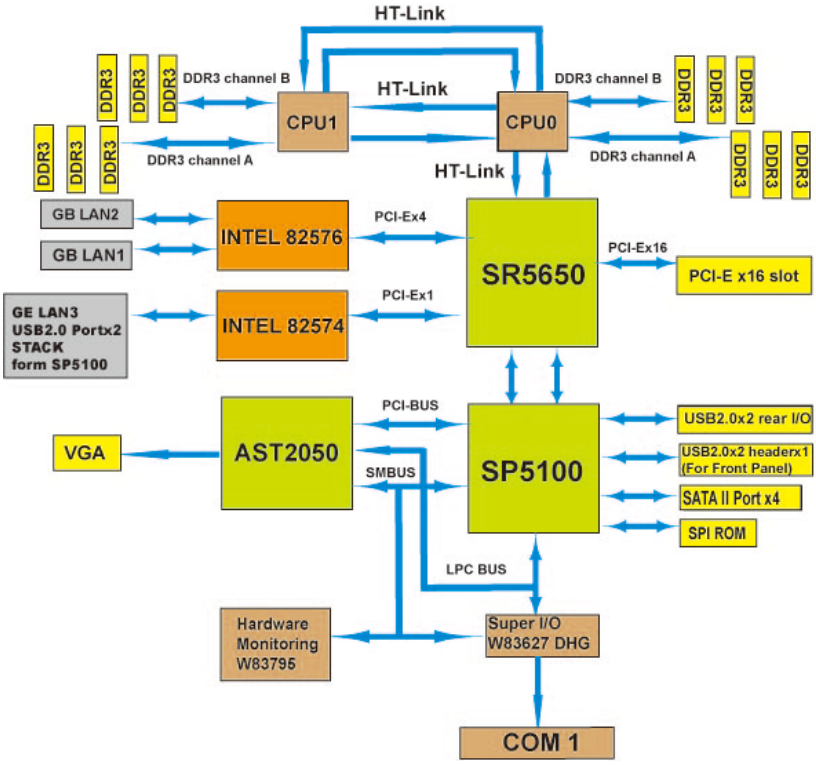
DO NOT APPLY POWER TO THE BOARD IF IT HAS BEEN DAMAGED.

2.1 - Board Image



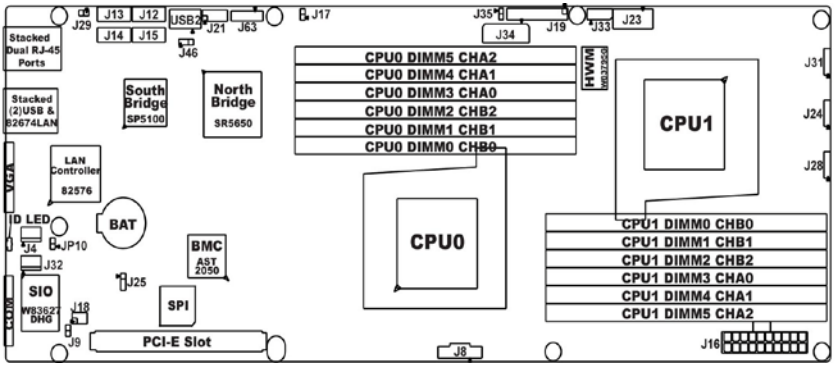
This diagram is representative of the latest motherboard (S8228) revision available at the time of publishing. The board you receive may not look exactly like the above diagram.

2.2 - Block Diagram



S8228 Block Diagram (Represents all SKUs)

2.3 - Board Parts, Jumpers and Connectors



This diagram is representative of the latest board revision (S YR190-B8228) available at the time of publishing. The board you receive may not look exactly like the above diagram.

Jumpers & Connectors

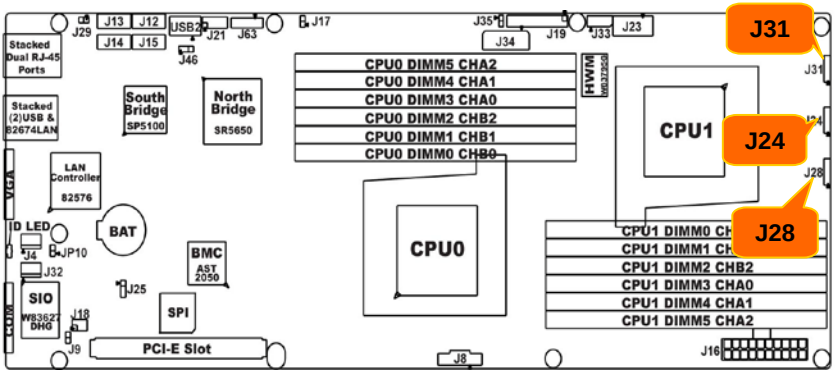
Jumper/Connector	Function
J24/J28/J31	Fan Pin Header
J8	PSMI Connector
J9	Intruder Switch
J17	Power Button Header
J18	LCM Pin Header
J19	Front Panel Pin Header
J21	USB Pin Header
J25	Clear CMOS
J29	BMC front panel lock switch
J33	IPMB Pin Header
J35	LAN3 LED Active Header
J46	SPI BIOS programming header
J63	SATA SGPIO Header
JP10	BMC Reset Switch

Jumper Legend

	OPEN - Jumper OFF	Without jumper cover
	CLOSED - Jumper ON	With jumper cover

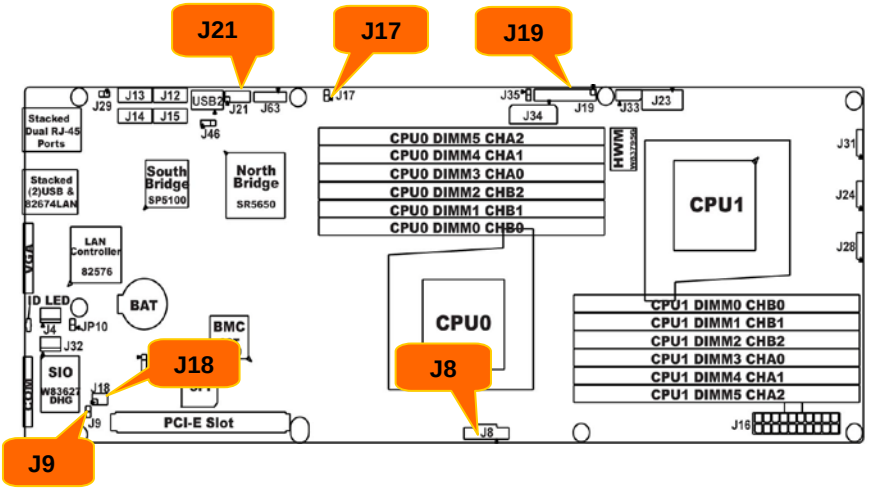
All the connector Pin_1 is marked with a triangle.

Jumper Placement



J24/J28/J31: 8-Pin FAN Connector

Pin	1	2	3	4	5	6	7	8
Signal	PWM	+12V	TACH	GND	GND	TACH	+12V	PWM



J8: PSMI Connector

Signal	Pin	Pin	Signal
SMBUSCL	1	2	SMBUSDA
ALERT	3	4	GND
VDD_3P3_DUAL	5		

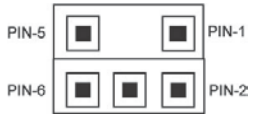
J9: INTRUDER Switch

Pin	1	2
Signal	INTRUDER_L	GND

J17: 2-PIN POWER BUTTON HEADER

Pin	Signal
1	FP_PWR_SW_N
2	GND

J18: LCM (3PIN x2 _ NP3) Pin Header

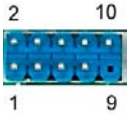


Signal	Pin	Pin	Signal
VDD_5_RUN	1	2	RXD
Key	3	4	GND
VDD_5_ALW	5	6	TXD

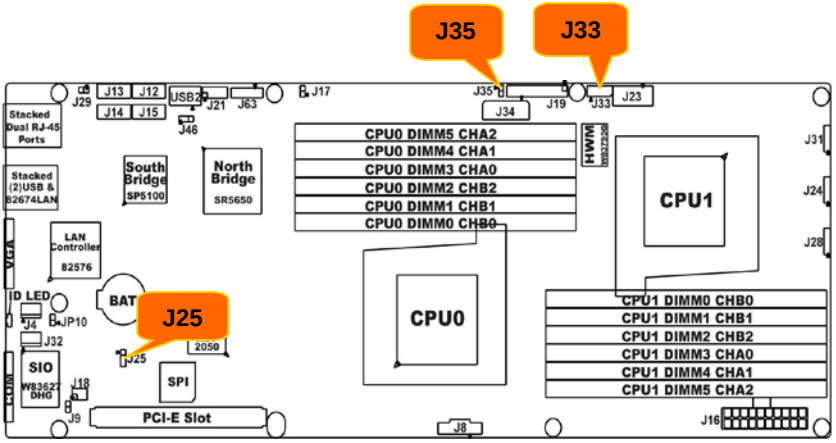
J19: Front Panel Connector

Signal	Pin	Pin	Signal
PW_LED+	1	2	FP_PWR
KEY	3	4	IDLED+
PW_LED-	5	6	IDLED-
HD-LED+	7	8	WARN_LED+
HD-LED-	9	10	WARN_LED-
PWR_SW	11	12	LAN1_LED+
GND	13	14	LAN1_LED-
RST_SW	15	16	SDA
GND	17	18	SCL
ID_SW	19	20	INTRUDER_L
TEMP	21	22	LAN2_LED+
NMI_SW	23	24	LAN2_LED-

J21: USB Pin Header (5PIN x2 _ NP9) FOR Front panel



Signal	Pin	Pin	Signal
+5VPWR	1	2	+5VPWR
USB2-	3	4	USB3-
USB2+	5	6	USB3+
GND	7	8	GND
Key	9	10	NC



J25 : Clear CMOS Switch

Pin_3 Pin_1	Pin	1	2	3
Pin_3 Pin_1	Signal	VBAT	SB700_VBAT	GND

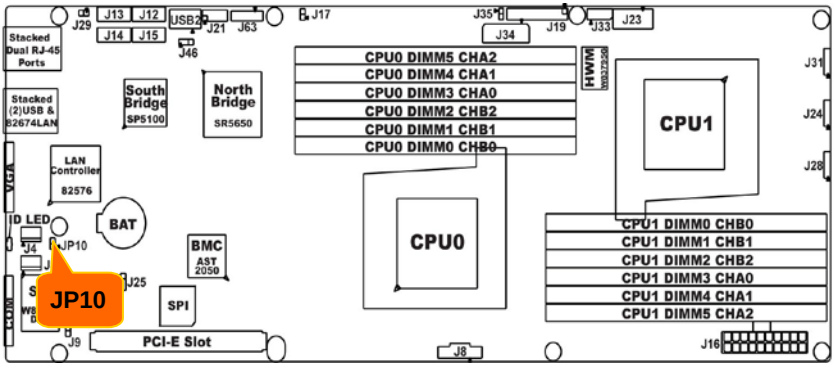
Pin_3 Pin_1 **Clear CMOS**	You can reset the CMOS settings by using this jumper if you have forgotten your system/setup password or need to clear system BIOS setting. 1. Power off system and disconnect both power connectors from the motherboard 2. Use jumper cap to close Pin_2 and Pin_3 for several seconds to Clear CMOS 3. Put jumper cap back to Pin_1 and Pin_2 (default setting) 4. Reconnect power & power on system
Pin_3 Pin_1 **Normal(Default)**	

J33: BMC IPMB Pin Header

Pin_1	Signal	Pin	Pin	Signal
	IPMB DATA	1	2	GND
	IPMB CLK	3	4	NC

J35：2-PIN LAN3 LED active header

Pin_1	Pin	1	2
	Signal	LAN3_LED1_ACT	VDD_3P3_DUAL
Function: LAN3 active header			



JP10： BMC Reset Switch

Pin_1	Pin	1	2
	Signal	BMC_SRST_N	GND

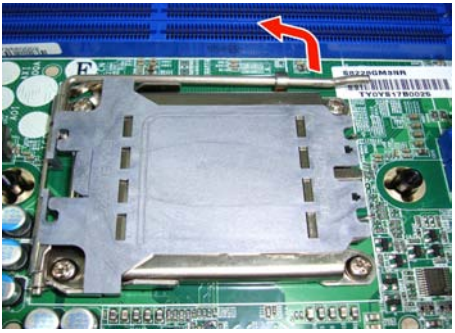
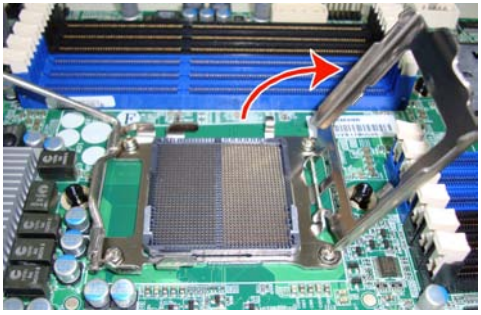
Onboard ID LED

	State	Color	Description
	On	Blue	System identified
	Off	Off	System not identified

NOTE：IPMI can activate ID LED from remote site.
Please visit the TYAN Web Site at **http://www.tyan.com** to download the latest AST2050 Software Configuration Guide for IPMI settings.

2.4 - Installing the Processor

Only AMD® "Opteron™ 4000 series" processors are certified and supported with this motherboard.
Check our website for latest processor support. **http://www.TYAN.com**
TYAN® is not liable for damage as a result of operating an unsupported configuration.

<table>
<tr><td>  </td><td>Step1:
Press the lever and unlock the CPU socket.</td></tr>
<tr><td>Step2:
Lift the CPU protection cap up and lay the CPU onto the socket (A), ensuring pin1 is correctly located (B).</td><td>A
  </td></tr>
</table>

B

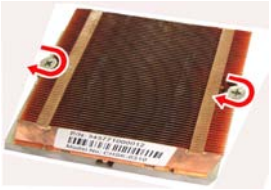
Step3:
Close the socket cover and press the CPU lever down to secure the CPU.

2.5 - Heat sink Installation

After installing the processor, you should proceed to install the heat sink. The CPU heat sink will ensure that the processor do not overheat and continue to operate at maximum performance for as long as you own them. The overheated processor is dangerous to the motherboard.

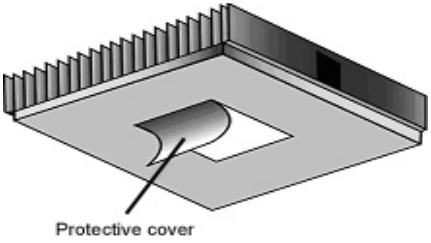
For the safest method of installation and information on choosing the appropriate heat sink, using heat sinks validated by AMD®.
Please refer to the AMD® website at **www.amd.com**

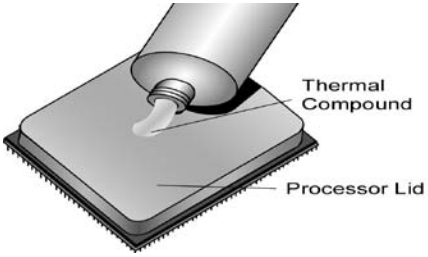
The following diagram illustrates how to install heat sink onto the CPU of S8228.



Place the heat sink on top of the CPU and secure it to the motherboard using two screws clockwise.

2.6 - Thermal Interface Material





There are two types of thermal interface materials designed for use with the processors.

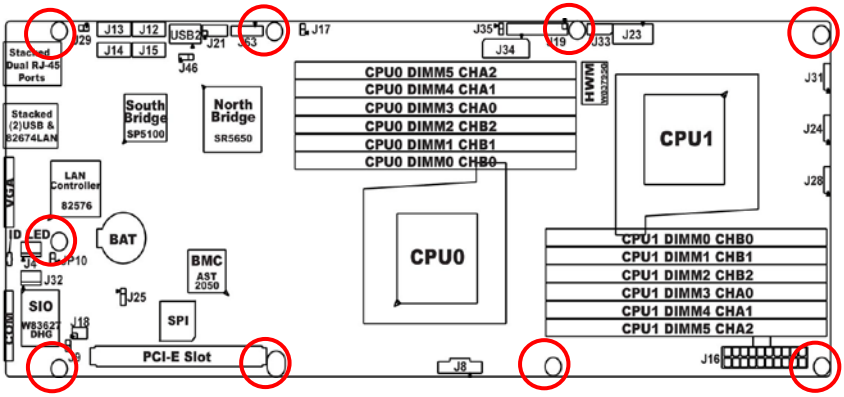
The most common material comes as a small pad attached to the heat sink at the time of purchase. There should be a protective cover over the material. Take care not to touch this material. Simply remove the protective cover and place the heat sink on the processor.

The second type of interface material is usually packaged separately. It is commonly referred to as 'thermal compound'. Simply apply a thin layer on to the CPU lid (applying too much will actually reduce the cooling).

Always check with the manufacturer of the heat sink & processor to ensure the thermal Interface material is compatible with the processor and meets the manufacturer's warranty requirements.

2.7 - Tips on Installing Motherboard in Chassis

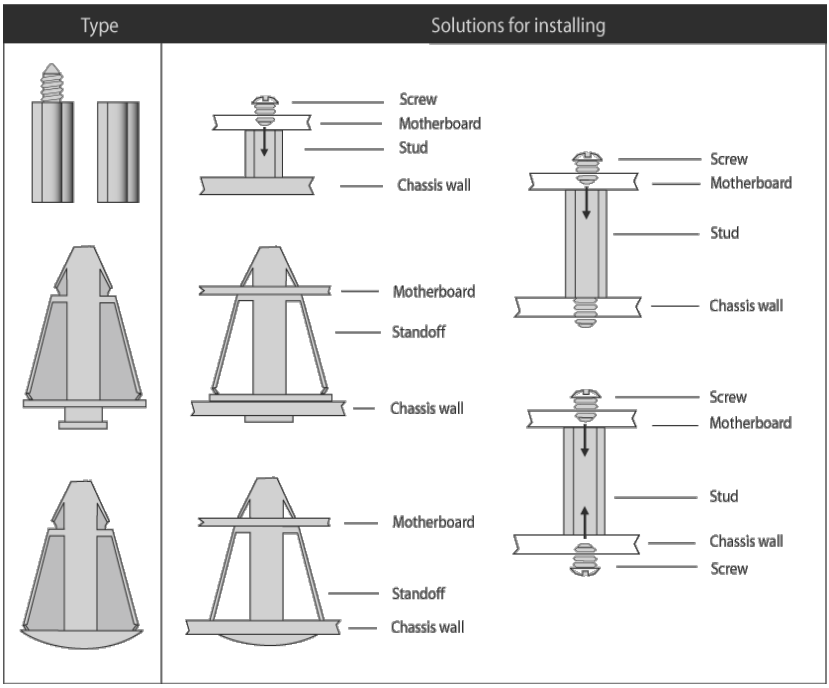
Before installing your motherboard, make sure your chassis has the necessary motherboard support studs installed. These studs are usually metal and are gold in color. Usually, the chassis manufacturer will pre-install the support studs. If you are unsure of stud placement, simply lay the motherboard inside the chassis and align the screw holes of the motherboard to the studs inside the case. If there are any studs missing, you will know right away since the motherboard will not be able to be securely installed.



Some chassis' include plastic studs instead of metal. Although the plastic studs are usable, TYAN® recommends using metal studs with screws that will fasten the motherboard more securely in place.

Below is a chart detailing what the most common motherboard studs look like and how they should be installed.

Mounting the Motherboard

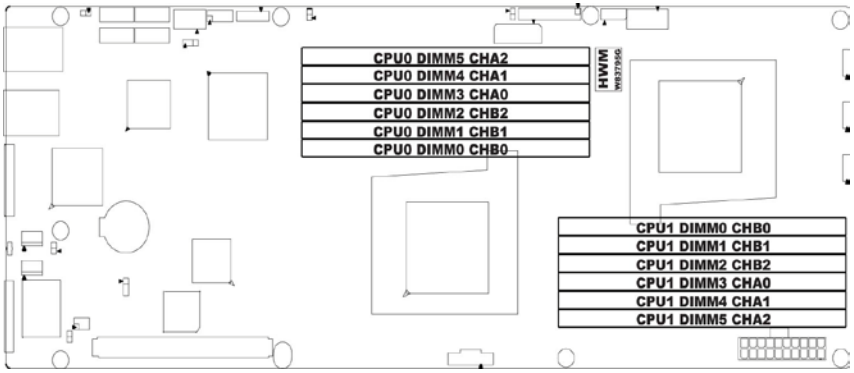


2.8 - Installing the Memory

Before installing memory, ensure that the memory you have is compatible with the motherboard and processor.

Overview

The motherboard comes with twelve Double Data Rate 3 (DDR3) Dual Inline Memory Modules (DIMM) sockets. The figure below illustrates the location of the DDR3 DIMM sockets.



- TYAN® S8228 series support up to 96GB Registered DDR-3 memory.
- **DDR3 800/1066/1333MHz RDIMM, UDIMM** are supported.
- All installed memory will automatically be detected and no jumpers or settings need changing.
- All memory must be of the same type and density.

1). For the DIMM number please refer to the motherboard placement in **"2.3 - Board Parts, Jumpers and Connectors"** for memory installation.

2). Refer to the memory population option table for recommended memory installation instruction.

Recommended Memory Population Table
(Registered)

To achieve the best performance, TYAN® strongly recommended memory installation configuration as listed below:

Registered DIMM	Single CPU (CPU0 only)			Dual CPU (CPU0 and CPU1)		
Quantity of memory installed	2	4	6	4	8	12
CPU0 DIMM0 CHB0		√	√		√	√
CPU0 DIMM1 CHB1			√			√
CPU0 DIMM2 CHB2	√	√	√	√	√	√
CPU0 DIMM3 CHA0		√	√		√	√
CPU0 DIMM4 CHA1			√			√
CPU0 DIMM5 CHA2	√	√	√	√	√	√
CPU1 DIMM6 CHB0					√	√
CPU1 DIMM7 CHB1						√
CPU1 DIMM8 CHB2				√	√	√
CPU1 DIMM9 CHA0					√	√
CPU1 DIMM10 CHA1						√
CPU1 DIMM11 CHA2				√	√	√

4R--Registered Memory Population Option Table

Registered DIMM	Single CPU (CPU0 only)			Dual CPU (CPU0 and CPU1)		
Quantity of memory installed	2	4	6	4	8	12
CPU0 DIMM0 CHB0						
CPU0 DIMM1 CHB1	√			√		
CPU0 DIMM2 CHB2						
CPU0 DIMM3 CHA0						
CPU0 DIMM4 CHA1	√			√		
CPU0 DIMM5 CHA2						
CPU1 DIMM6 CHB0						
CPU1 DIMM7 CHB1				√		
CPU1 DIMM8 CHB2						
CPU1 DIMM9 CHA0						

CPU1 DIMM10 CHA1				√		
CPU1 DIMM11 CHA2						

Unbuffered Memory Population Option Table

Unbuffered DIMM	Single CPU (CPU0 only)			Dual CPU (CPU0 and CPU1)		
Quantity of memory installed	2	4		4	8	
CPU0 DIMM0 CHB0		√			√	
CPU0 DIMM1 CHB1						
CPU0 DIMM2 CHB2	√	√		√	√	
CPU0 DIMM3 CHA0		√			√	
CPU0 DIMM4 CHA1						
CPU0 DIMM5 CHA2	√	√		√	√	
CPU1 DIMM6 CHB0					√	
CPU1 DIMM7 CHB1						
CPU1 DIMM8 CHB2				√	√	
CPU1 DIMM9 CHA0					√	
CPU1 DIMM10 CHA1						
CPU1 DIMM11 CHA2				√	√	

NOTE:

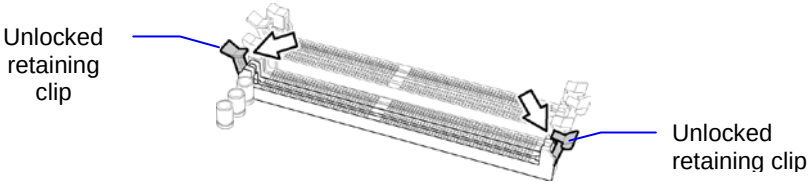
- **"√"**indicates a populated DIMM slot.
- If installing only **one** processor, you can choose CPU0.

Memory Installation Procedure

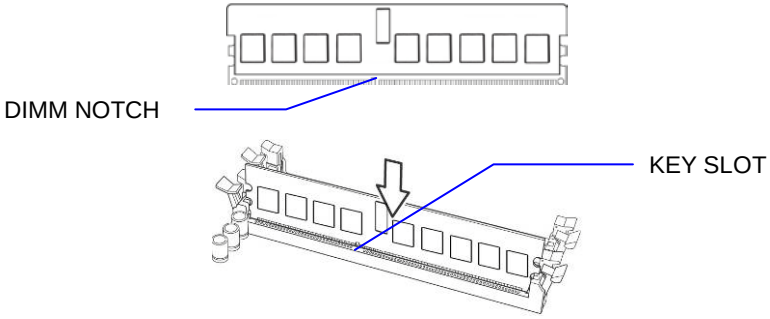
Ensure to unplug the power supply before adding or removing DIMMs or other system components, Failure to do so may cause severe damage to both the motherboard and the components.

Follow these instructions to install memory modules into the S8228.

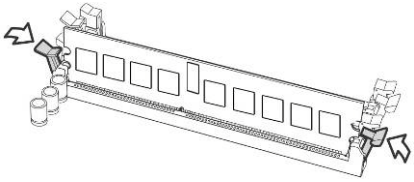
1. Unlock a DIMM socket by Press the retaining clip outwardly in the following illustration.



2. Align the memory module with the socket，such that the DIMM NOTCH match the KEY SLOT on the socket.



3. Hold the DIMM by both of its ends. Insert the module vertically into the socket. Apply force to both ends of the DIMM simultaneously until the retaining clip pop up into place. And the DIMM cannot be pushed in any further to ensure proper sitting of the DIMM.



2.9 - Attaching Drive Cables

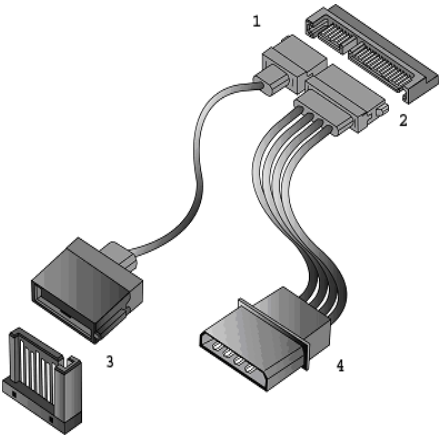
Attaching Serial ATA Cables

S8228 is equipped with **4** Serial ATA (SATA) channels. Connections for the drives are very simple.

There is no need to set Master/Slave jumpers on SATA drives.

If you are in need of SATA/SAS cables or power adapters please contact your place of purchase.

The following pictures illustrate how to connect an SATA drive



1. SATA drive cable connection

2. SATA drive power connection

3. SATA cable motherboard connector

4. SATA drive power adapter

2.10 - Installing Add-In Cards

Before installing add-in cards, it's helpful to know if they are fully compatible with your motherboard. For this reason, we've provided the diagrams below, showing the slots that may appear on your motherboard.

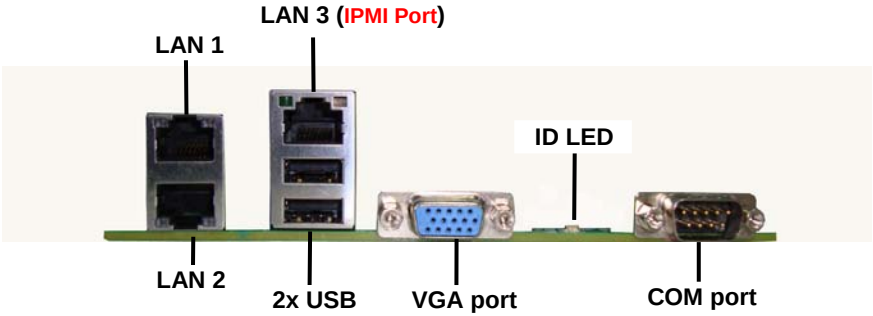
PCI-E x 16 slot

Simply find the appropriate slot for your add-in card and insert the card firmly. Do not force any add-in cards into any slots if they do not seat in place. It is better to try another slot or return the faulty card rather than damaging both the motherboard and the add-in card.

YOU MUST ALWAYS unplug the power connector to the motherboard before performing system hardware changes to avoid damaging the board or expansion device.

2.11 - Connecting External Devices

Your motherboard supports a number of different interfaces through connecting peripherals. See the following diagrams for the details.



Peripheral devices can be plugged straight into any of these ports but software may be required to complete the installation.

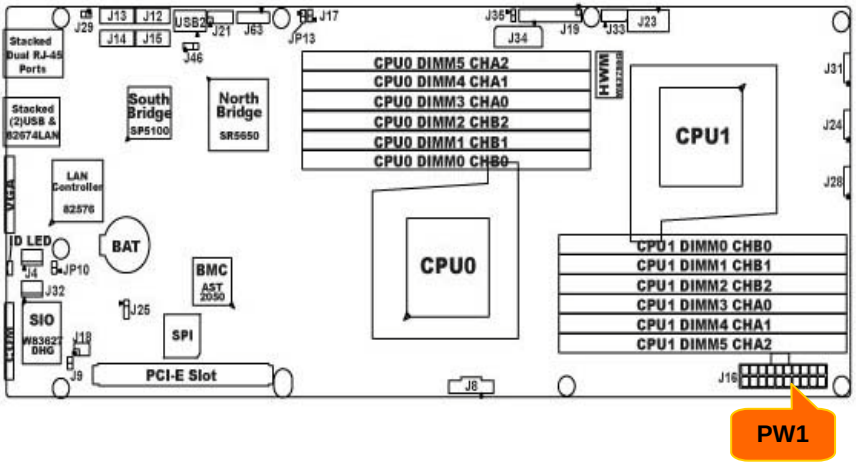
Onboard LAN LED Color Definition

The three onboard Ethernet ports have green and yellow LEDs to indicate LAN status. The chart below illustrates the different LED states.

10/100/1000 Mbps LAN Link/Activity LED Scheme			
		Left LED	**Right LED**
10 Mbps	**Link**	Green	Amber
	Active	Blinking Green	Green
100 Mbps	**Link**	Green	Amber
	Active	Blinking Green	Green
1000 Mbps	**Link**	Green	Amber
	Active	Blinking Green	Green
No Link/10Mb mode(Right)		Off	Off

2.12 - Installing the Power Supply

The S8228 motherboard requires a proprietary power supply. This product does not follow a standard ATX, ATX12v or EPS12v power connector specification. Only the PW1 20-pin connector is required to properly power the S8228.



TYAN recommends the use of YR190 B8228-X2 Transport System for a complete barebones solution that includes chassis, power supply and motherboard solution. If a separate design is required, the 20-pin proprietary connector design would need to follow the outline below. TYAN would also suggest a minimum of 450w per node minimum.

PW1: J16 20-Pin Power Connector (Proprietary Design)

Signal	Pin	Pin	Signal
GND	1	2	GND
GND	3	4	GND
GND	5	6	NC
GND	7	8	+12V
GND	9	10	+12V
PSON	11	12	5VSB
GND	13	14	GND
GND	15	16	NC
+12V	17	18	+12V
+12V	19	20	+12V

PWR 2: J34 4-Pin Molex Power Connector (Barebones use only)

Signal	Pin	Pin	Signal
+12V	1	2	GND
GND	3	4	+5V

The 4-pin Molex Power Connector is provided for exclusive use with the TYAN YR190-B8228-X2 barebones solution to provide power for the HDD backplane.

2.13 - Finishing Up

Congratulations on making it this far! You're finished setting up the hardware aspects of your computer. Before closing up your chassis, make sure that all cables and wires are connected properly, especially IDE cables and most importantly, jumpers. You may have difficulty powering on your system if the motherboard jumpers are not set correctly. In the rare circumstance that you have experienced difficulty, you can find help by asking your vendor for assistance. If they are not available for assistance, please find setup information and documentation online at our website or by calling your vendor's support line.

Chapter 3: BIOS Setup

3.1 - About the BIOS

The BIOS is the basic input/output system, the firmware on the motherboard that enables your hardware to interface with your software. The BIOS determines what a computer can do without accessing programs from a disk. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and a number of miscellaneous functions. This chapter describes the various BIOS settings that can be used to configure your system.

The BIOS section of this manual is subject to change without notice and is provided for reference purposes only. The settings and configurations of the BIOS are current at the time of print and are subject to change, and therefore may not match exactly what is displayed on screen.

This section describes the BIOS setup program. The setup program lets you modify basic configuration settings. The settings are then stored in a dedicated, battery-backed memory (called NVRAM) that retains the information even when the power is turned off.

To start the BIOS setup utility:

1. Turn on or reboot your system.
2. Press <Del> during POST (<Tab> on remote console) to start the BIOS setup utility.

3.2 - BIOS Menu Bar

The menu bar at the top of the windows lists these selections:

Main	To configure basic system setups
Advanced	To configure the advanced chipset features
PCI/PnP	To configure legacy Plug & Play or PCI settings
Boot	To configure system boot order
Security	To configure user and supervisor passwords
Chipset	To configure chipset management features
Exit	To exit setup utility

3.3 - Setup Basics

The table below shows how to navigate in the setup program using the keyboard.

Key	Function
<F1>	General help window
<ESC>	Exit current menu
← → arrow keys	Select a different menu
↑ or ↓ arrow keys	Move cursor up/down
<Tab> / <Shift-Tab>	Cycle cursor up/down
<Home> / <End>	Move cursor to top/bottom of the window
<PgUp> / <PgDn>	Move cursor to next/previous page
<->	Select the previous value/setting of the field
<+>	Select the next value/setting of the field
<F8>	Load Fail Safe default configuration values of the menu
<F9>	Load the Optimal default configuration values of the menu
<F10>	Save and exit
<Enter>	Execute command or select submenu

3.4 - Getting Help

Pressing [**F1**] will display a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press [**ESC**].

3.5 - In Case of Problems

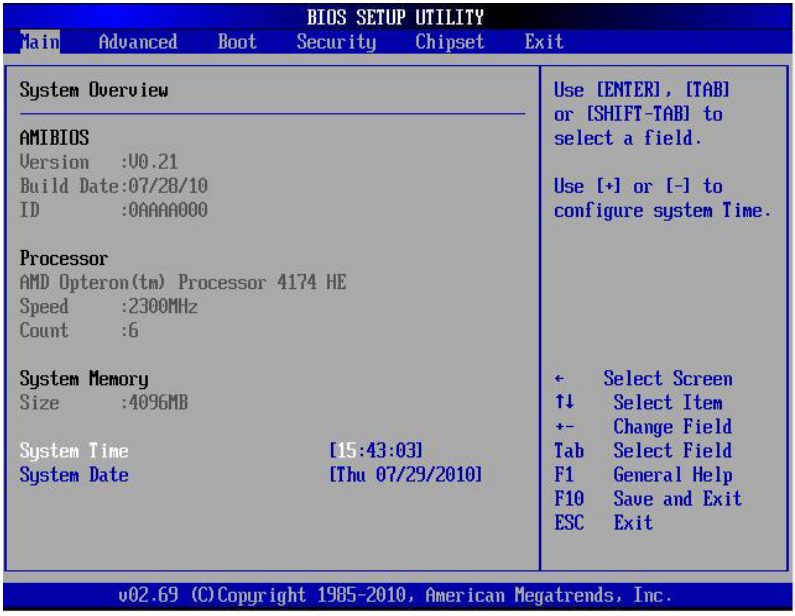
If you have trouble booting your computer after making and saving the changes with the BIOS setup program, you can restart the computer by holding the power button down until the computer shuts off (usually within 4 seconds); resetting by pressing CTRL-ALT-DEL; or clearing the CMOS.The best advice is to only alter settings that you thoroughly understand. In particular, do not change settings in the Chipset section unless you are absolutely sure of what you are doing. The Chipset defaults have been carefully chosen either by TYAN® or your system manufacturer for best performance and reliability. Even a seemingly small change to the Chipset setup options may cause the system to become unstable or unusable.

The following pages provide the details of BIOS menu. Please be noticed that the BIOS menu are continually changing due to the BIOS updating. The BIOS menu provided are the most updated when this manual is written. Please visit TYAN®'s website at **http://www.TYAN.com** for the information of BIOS updating.

3.6 - BIOS Main Menu

The Main BIOS Menu is the first screen that you can navigate. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured, options in blue can be changed.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often, a text message will accompany it.



Feature	Option	Description
Main		
System Time	**HH : MM : SS**	Set the system time
System Date	**MM : DD : YYYY**	Set the system date

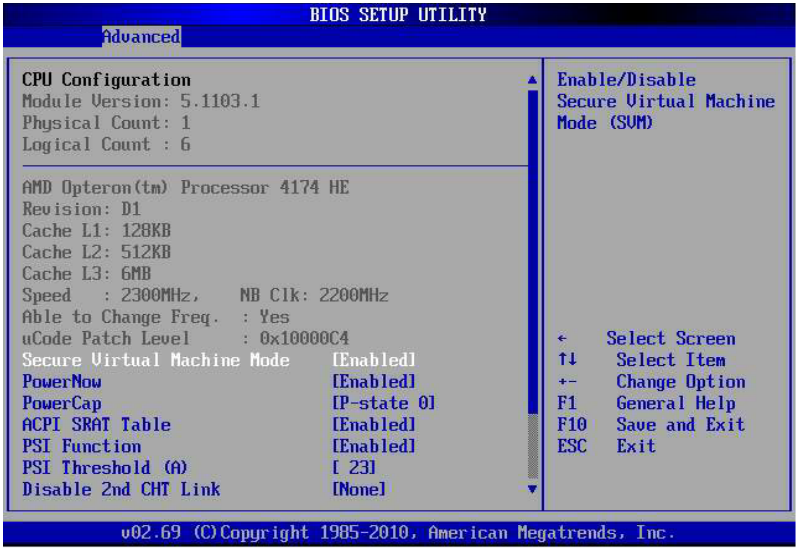
3.7 - BIOS Advanced Menu

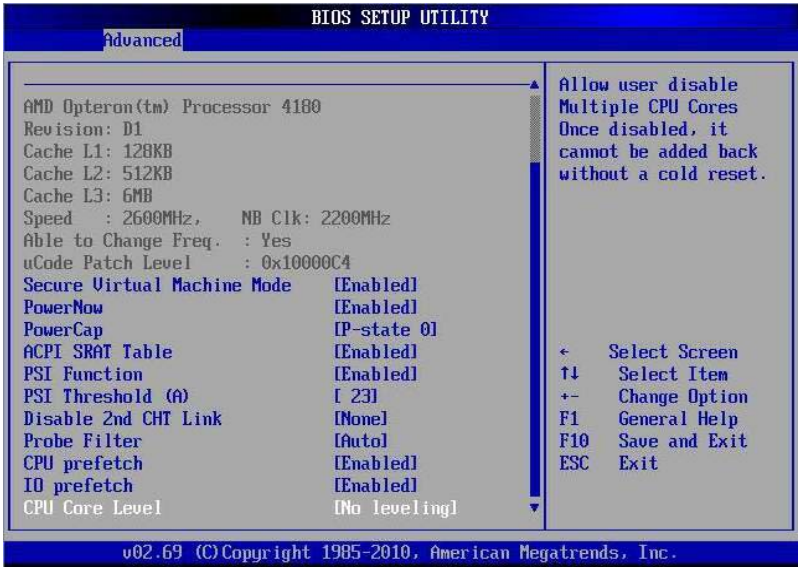
You can select any of the items in the left frame of the screen, such as Super I/O Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.

Feature	Option	Description
Advanced Settings		
CPU Configuration	**Menu Item**	Configure CPU
IDE Configuration	**Menu Item**	Configure the IDE device(s)
Super IO Configuration	**Menu Item**	Configures Super IO Chipset Win627DHG
ACPI Configuration	**Menu Item**	Section for Advanced ACPI Configuration
Hardware Health Configuration	**Menu Item**	Configure/monitor the Hardware Health
IPMI 2.0 Configuration	**Menu Item**	IPMI configuration including server monitoring and event log
Remote Access Configuration	**Menu Item**	Configure Remote Access
USB Configuration	**Menu Item**	Configure the USB support
Hyper Transport Configuration	**Menu Item**	Configure Coherent and Non coherent HT Link

3.7.1 - CPU Configuration

You can use this screen to view CPU Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.




BIOS SETUP UTILITY
Advanced
AMD Opteron(tm) Processor 4180
Revision: D1
Cache L1: 128KB
Cache L2: 512KB
Cache L3: 6MB
Speed : 2600MHz, NB Clk: 2200MHz
Able to Change Freq. : Yes
uCode Patch Level : 0x10000C4
Secure Virtual Machine Mode [Enabled]
PowerNow [Enabled]
PowerCap [P-state 0]
ACPI SRAT Table [Enabled]
PSI Function [Enabled]
PSI Threshold (A) [23]
Disable 2nd CHT Link [None]
Probe Filter [Auto]
CPU prefetch [Enabled]
IO prefetch [Enabled]
CPU Core Level [No leveling]
Allow user disable Multiple CPU Cores Once disabled, it cannot be added back without a cold reset.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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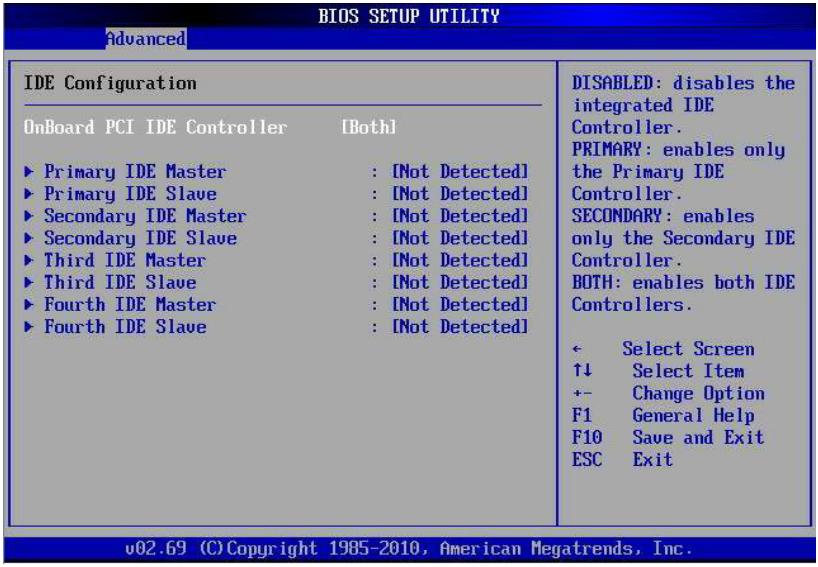
Feature	Option	Description
CPU Configuration		
Manufacturer	**Read only**	Displays information about CPU
Revision		
Cache L1		
Cache L2		
Cache L3		
BCLK Speed		
Frequency		
Ucode Patch Level		
SecureVirtual Machine Mode	**Enabled**	Secure Virtual Machine Mode
	Disabled	
Power Now	**Enabled**	Enable/disable the generation of ACPI,_PPC,PSS,and_PCT objects
	Disabled	
Power Cap	**P-state 0/1/2/3/4**	This option can decide the highest performance P-state in OS.
ACPI SRAT Table	**Enabled**	Enable or Disable the building of ACPI SRAT Table
	Disabled	
PSI Function	**Enabled**	Disable: If MB does not support PSI. Enable: PSI 1-phase function is enabled under threshold current
	Disabled	
	Auto	
PSI Threshold (A)	**23**	Enable/Disable PSI function. Don't change it unless you know what you do
Disable 2nd CHT Link	**None**	Note: need a cold boot to restore the setting
	CPU0 L0-CPU1 L2	
	CPU0 L2-CPU1 L0	
Probe Filter	**Auto**	Enable or Disable Probe Filter Function
	Disabled	
	Enabled	
CPU prefetch	**Enabled**	Enable or Disable CPU prefetch
	Disabled	
IO prefetch	**Enabled**	Enable or Disable IO prefetch
	Disabled	
CPU Core Level	**No Leveling**	Allow user disable Multiple CPU Cores Once disabled, it cannot be added back without a cold reset.
	Power of 2 cores	
	1/2/3/4/5/6 cores	

Power Cap **is hidden and will appear when** *Power Now* **is** set to **[Enabled].**

3.7.2 - IDE Configuration

You can use this screen to select options for the IDE Configuration Settings. Use the up and down <Arrow> Keys to select an item. Use the <Plus> and <Minus> Keys to change the value of the selection options.


BIOS SETUP UTILITY
Advanced
IDE Configuration
OnBoard PCI IDE Controller [Both]
Primary IDE Master : [Not Detected]
Primary IDE Slave : [Not Detected]
Secondary IDE Master : [Not Detected]
Secondary IDE Slave : [Not Detected]
Third IDE Master : [Not Detected]
Third IDE Slave : [Not Detected]
Fourth IDE Master : [Not Detected]
Fourth IDE Slave : [Not Detected]
DISABLED: disables the integrated IDE Controller.
PRIMARY: enables only the Primary IDE Controller.
SECONDARY: enables only the Secondary IDE Controller.
BOTH: enables both IDE Controllers.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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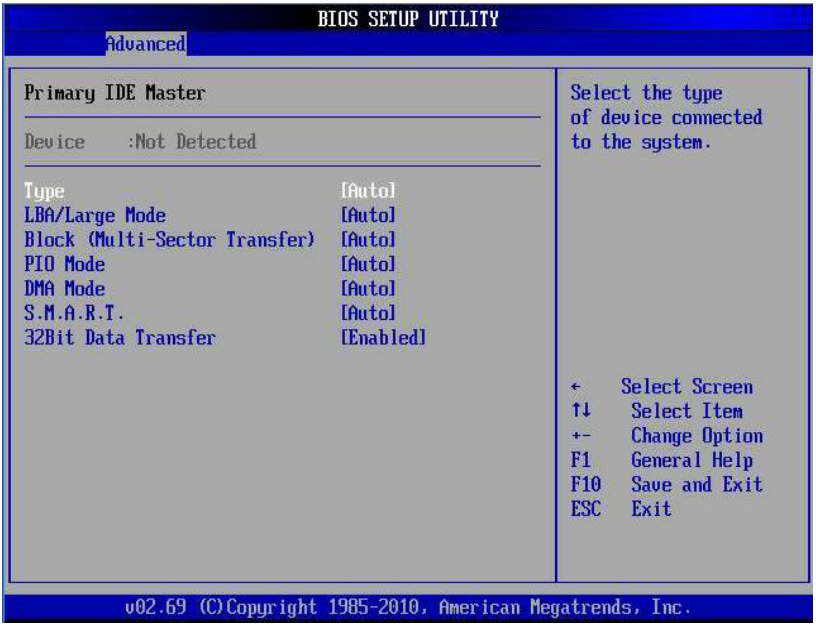
Feature	Option	Description
Onboard PCI IDE Controller	Disabled	disables the integrated IDE Controller
	Primary	enables only the Primary IDE Controller
	Secondary	enables only the Secondary IDE Controller
	Both	enables both IDE Controller

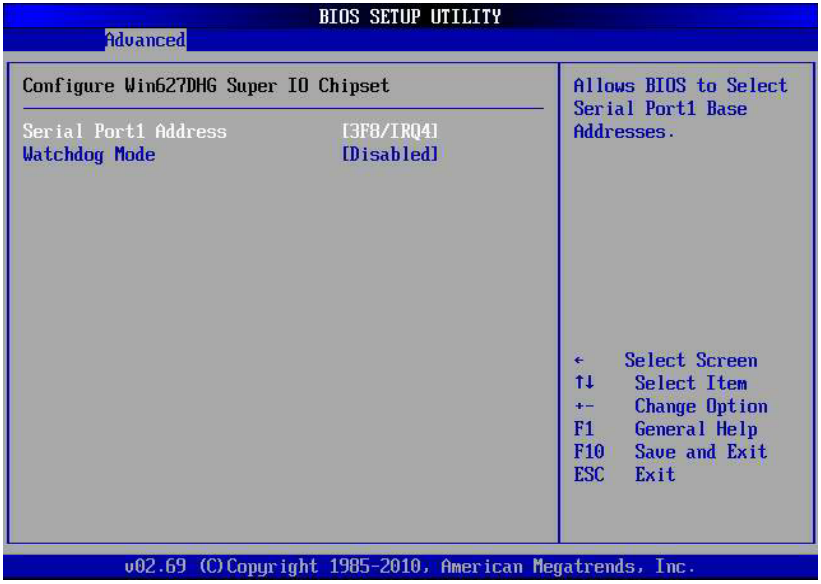
3.7.2.1 - IDE Configuration Sub-Menu



Feature	Option	Description
Primary IDE Master		
Type	Not Installed	Select the type of device connected to the system
	Auto	
	CD/DVD	
	ARMD	
LBA/Large Mode	Disabled	Disabled: Disables LBA Mode Auto: Enables LBA Mode if the device supports it and the device is not already formatted with LBA Mode disabled.
	Auto	
Block(Multi-Sector Transfer	Disabled	Disabled: The data transfer from and to the device occurs one sector at a time. Auto: The data transfer from and to the device occurs multiple sectors at a time if the device supports it.
	Auto	
PIO Mode	**Auto**	Select Auto to enhance hard disk performance by optimizing the hard disk timing.
	0~4(at 1 interval)	
DMA Mode	**Auto**	Select DMA Mode Auto: Auto detected SWDMAn: Single Word DMAn MWDMAn: Multi Word DMAn UDMAn: UltraDMAn
S. M. A. R. T	**Auto**	S. M. A. R. T stands for Self-Monitoring，Analysis and Reporting Technology.
	Disabled	
	Enabled	
32 Bit Data Transfer	Disabled	Enable/Disable 32-bit Data transfer
	Enabled	

3.7.3 - Super I/O Configuration Sub- Menu

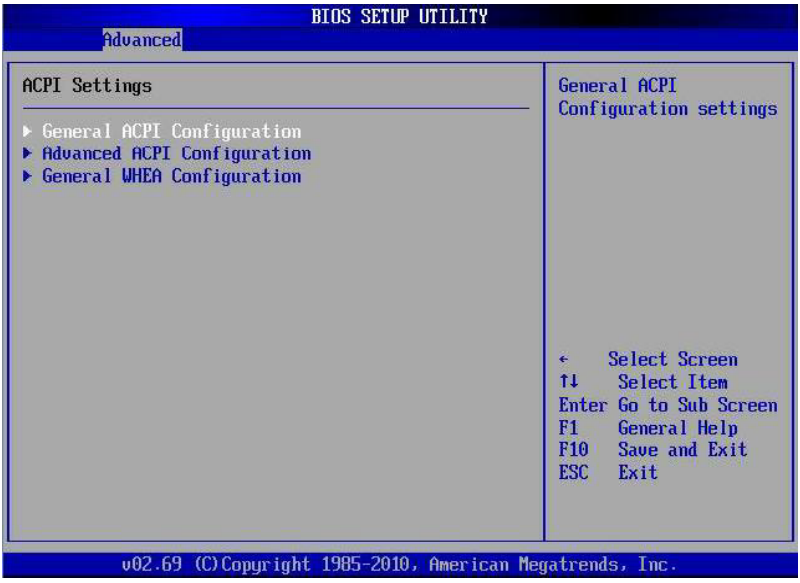
You can use this screen to select options for the Super I/O settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



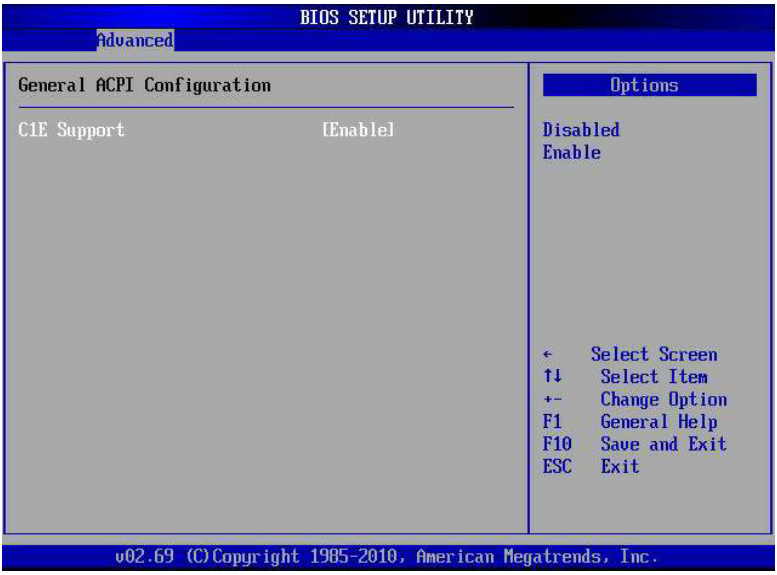
Feature	Option	Description
Configure Win627DHG Super I/O Chipset		
Serial Port1 Address	Disabled	Allow BIOS to select Serial Port1 Base Addresses.
	3F8 IRQ4	
	2E8 IRQ3	
Watchdog Mode	**Disabled**	POST: BIOS POST Watchdog timer counting, start at Power On stop at OS boot. OS: OS boot watchdog, start at OS boot. Power On: Start at Power On
	POST	
	OS	
	Power ON	

3.7.4 - ACPI Configuration Sub-Menu

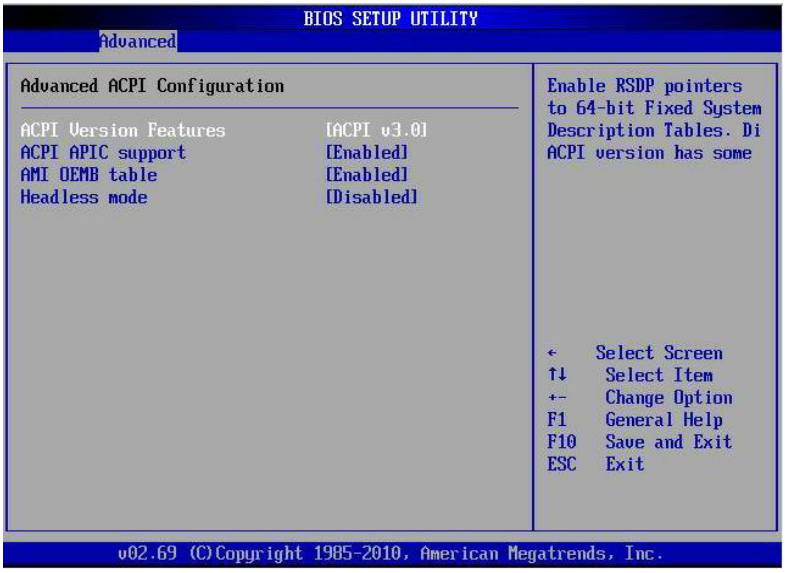
Use this screen to select options for ACPI. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described on this page. The screen is shown below.



3.7.4.1 – General ACPI Configuration sub-menu



3.7.4.2 – Advanced ACPI Configuration sub-menu


BIOS SETUP UTILITY
Advanced
Advanced ACPI Configuration
ACPI Version Features [ACPI v3.0]
ACPI APIC support [Enabled]
AMI OEMB table [Enabled]
Headless mode [Disabled]
Enable RSDP pointers to 64-bit Fixed System Description Tables. Di ACPI version has some
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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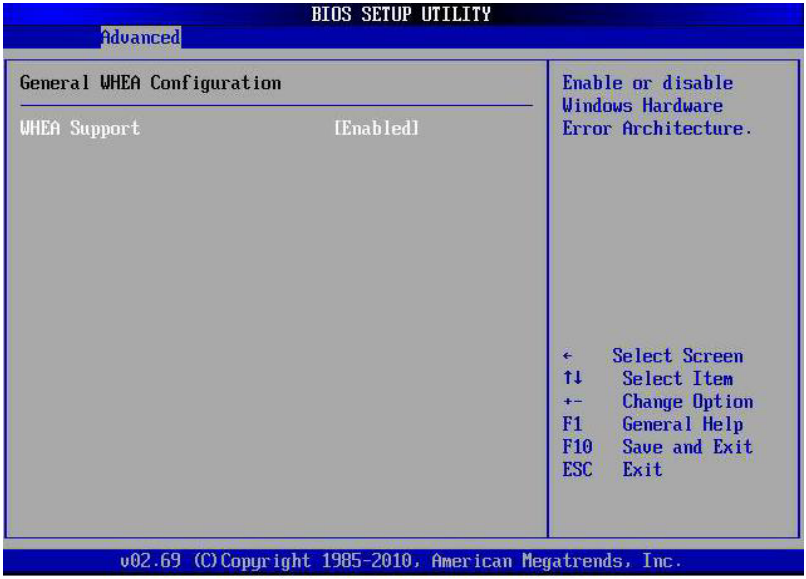
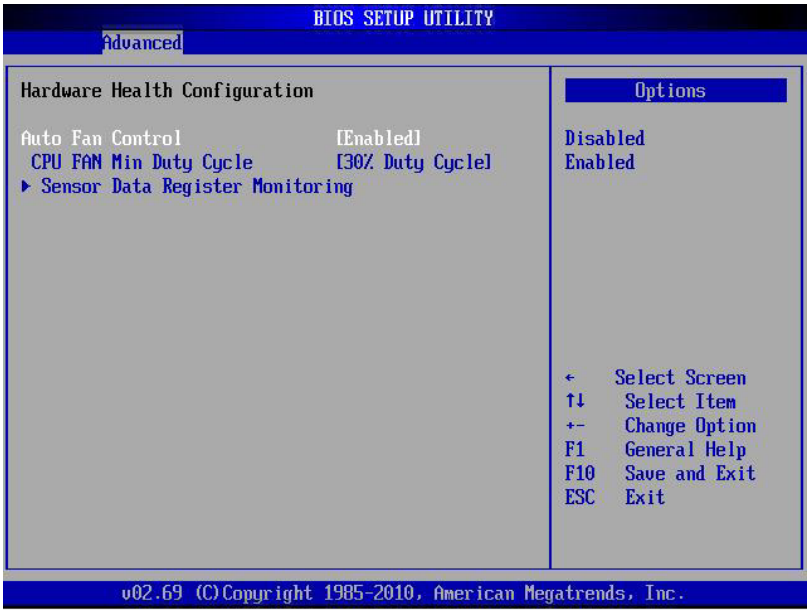
Feature	Option	Description
Advanced ACPI Configuration		
ACPI Version Features	ACPI v1.0	Choose ACPI version
	ACPI v2.0	
	ACPI v3.0	
ACPI APIC Support	Disabled	Include ACPI APIC table pointer to RSDT pointer list.
	Enabled	
AMI OEMB table	Disabled	Include OEMB table pointer to R(X) SDT pointer lists.
	Enabled	
Headless mode	**Disabled**	Enable/Disable Headless operation mode through ACPI.
	Enabled	

3.7.4.3 – Advanced ACPI Configuration sub-menu



3.7.5 - Hardware Health Configuration Sub-Menu

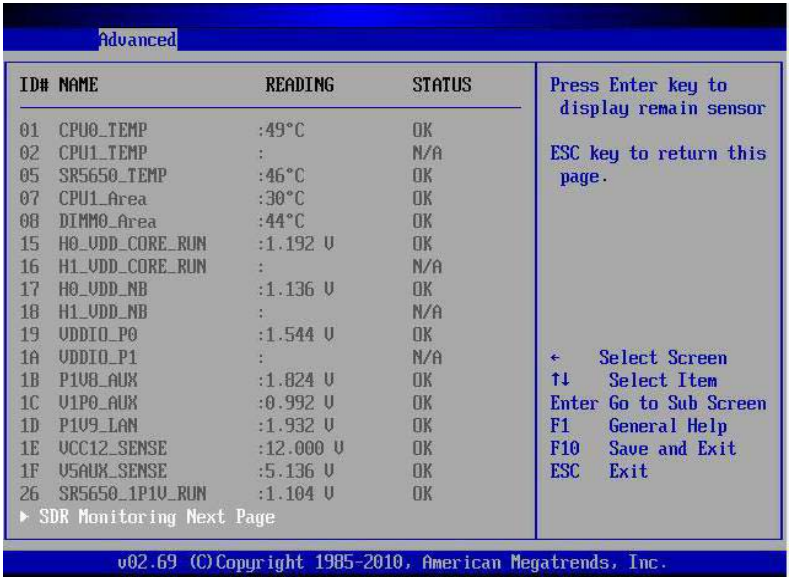
You can use this screen to view the Hardware Health Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



Feature	Option	Description
Hardware Health Configuration		
Auto FAN Control	Disabled	Select Smart FAN mode
	Enabled	
CPU FAN Min Duty Cycle	**30%Duty Cycle**	This item allows you to set minimum PWM Duty Cycle
	45%	
	60%	

CPU FAN Min Duty Cycle is hidden and will appear when ***Auto FAN Power Control*** is set to **[Enabled].**

3.7.5.1 - Sensor Data Configuration Sub-Menu


Advanced
ID# NAME READING STATUS
01 CPU0_TEMP :49°C OK
02 CPU1_TEMP : N/A
05 SR5650_TEMP :46°C OK
07 CPU1_Area :30°C OK
08 DIMM0_Area :44°C OK
15 H0_VDD_CORE_RUN :1.192 V OK
16 H1_VDD_CORE_RUN : N/A
17 H0_VDD_NB :1.136 V OK
18 H1_VDD_NB : N/A
19 VDDIO_P0 :1.544 V OK
1A VDDIO_P1 : N/A
1B P1V8_AUX :1.824 V OK
1C V1P0_AUX :0.992 V OK
1D P1V9_LAN :1.932 V OK
1E VCC12_SENSE :12.000 V OK
1F V5AUX_SENSE :5.136 V OK
26 SR5650_1P1V_RUN :1.104 V OK
▶ SDR Monitoring Next Page
Press Enter key to display remain sensor
ESC key to return this page.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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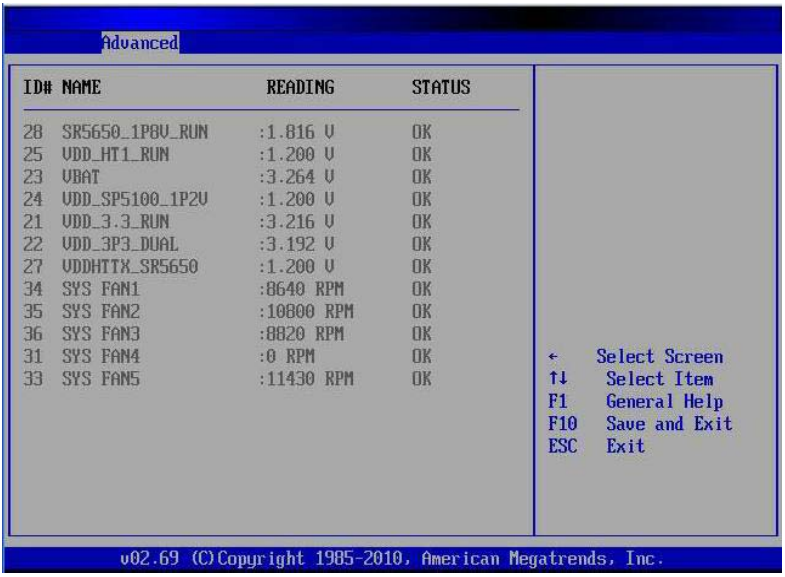
Advanced
ID# NAME READING STATUS
28 SR5650_1P8V_RUN :1.816 V OK
25 VDD_HT1_RUN :1.200 V OK
23 VBAT :3.264 V OK
24 VDD_SP5100_1P2V :1.200 V OK
21 VDD_3.3_RUN :3.216 V OK
22 VDD_3P3_DUAL :3.192 V OK
27 VDDHTTX_SR5650 :1.200 V OK
34 SYS FAN1 :8640 RPM OK
35 SYS FAN2 :10800 RPM OK
36 SYS FAN3 :8820 RPM OK
31 SYS FAN4 :0 RPM OK
33 SYS FAN5 :11430 RPM OK
← Select Screen
↑↓ Select Item
F1 General Help
F10 Save and Exit
ESC Exit
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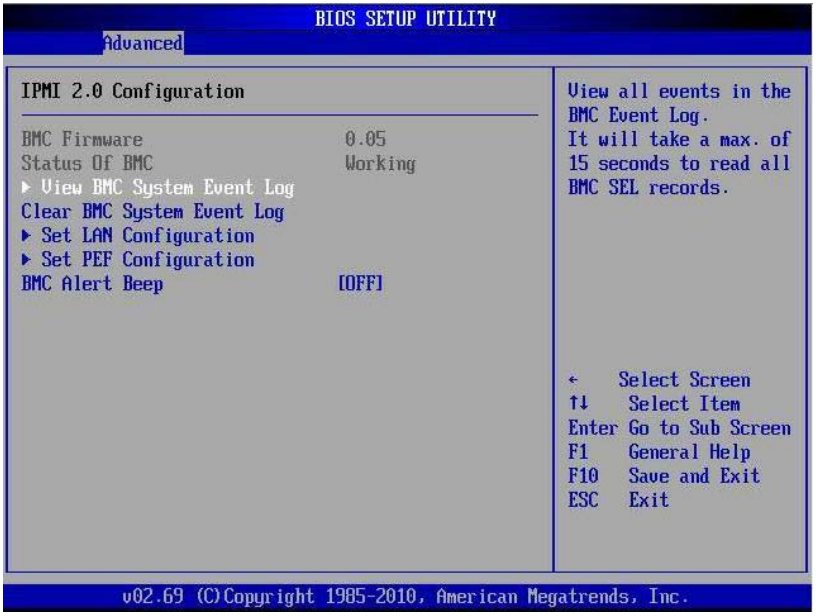
Read only. It can not be modified in user mode.

3.7.6 IPMI 2.0 Configuration Sub-Menu

You can use this screen to view the IPMI 2.0 Configuration Settings. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.


BIOS SETUP UTILITY
Advanced
IPMI 2.0 Configuration
BMC Firmware 0.05
Status Of BMC Working
▸ View BMC System Event Log
Clear BMC System Event Log
▸ Set LAN Configuration
▸ Set PEF Configuration
BMC Alert Beep [OFF]
View all events in the BMC Event Log.
It will take a max. of 15 seconds to read all BMC SEL records.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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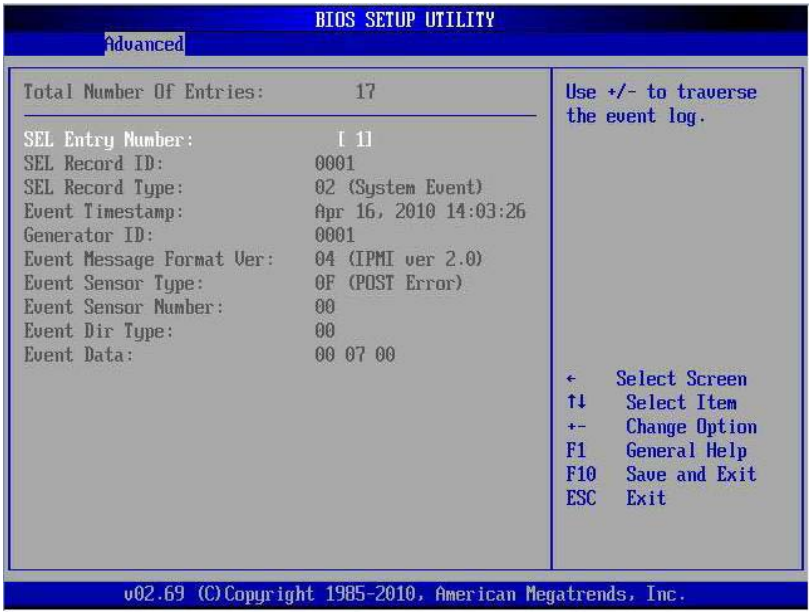
Feature	Option	Description
IPMI 2.0 Configuration		
BMC Firmware	**Read only**	------
Status of BMC	**Read only**	------
Clear BMC System Event Log	**[Enter]**	Clear all events in BMC System Event Log.
BMC Alert Beep	**Off**	BMC Alert Beep On/Off
	On	

3.7.6.1 View BMC System Event Log Sub-Menu


BIOS SETUP UTILITY
Advanced
Total Number Of Entries: 17
SEL Entry Number: [1]
SEL Record ID: 0001
SEL Record Type: 02 (System Event)
Event Timestamp: Apr 16, 2010 14:03:26
Generator ID: 0001
Event Message Format Ver: 04 (IPMI ver 2.0)
Event Sensor Type: 0F (POST Error)
Event Sensor Number: 00
Event Dir Type: 00
Event Data: 00 07 00
Use +/- to traverse the event log.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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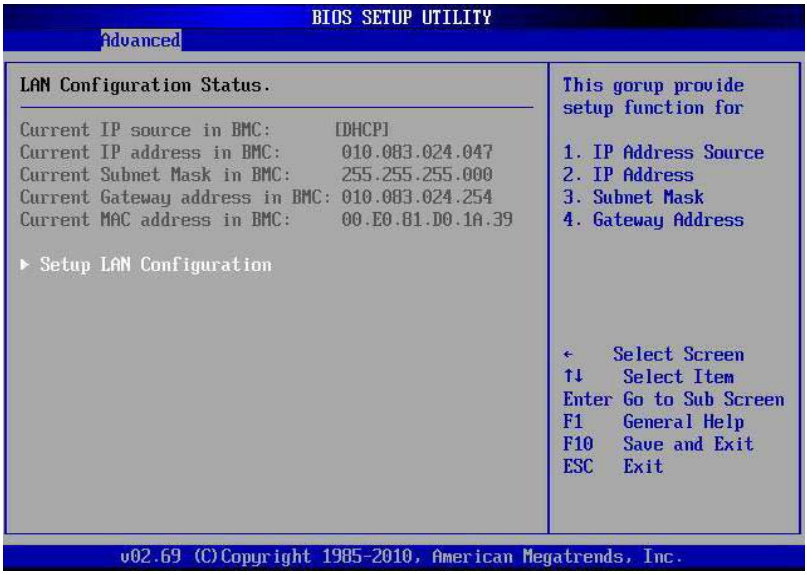
Read only. It can not be modified in user mode.

3.7.6.2 LAN Configuration Sub-Menu


BIOS SETUP UTILITY
Advanced
LAN Configuration Status.
Current IP source in BMC: [DHCP]
Current IP address in BMC: 010.083.024.047
Current Subnet Mask in BMC: 255.255.255.000
Current Gateway address in BMC: 010.083.024.254
Current MAC address in BMC: 00.E0.81.D0.1A.39
▶ Setup LAN Configuration
This gorup provide setup function for
1. IP Address Source
2. IP Address
3. Subnet Mask
4. Gateway Address
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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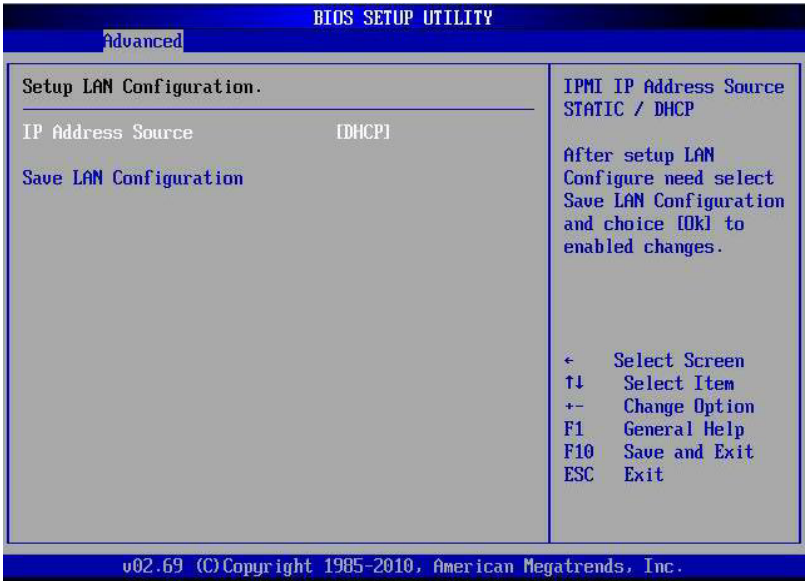
BIOS SETUP UTILITY
Advanced
Setup LAN Configuration.
IP Address Source [DHCP]
Save LAN Configuration
IPMI IP Address Source STATIC / DHCP
After setup LAN Configure need select Save LAN Configuration and choice [Ok] to enabled changes.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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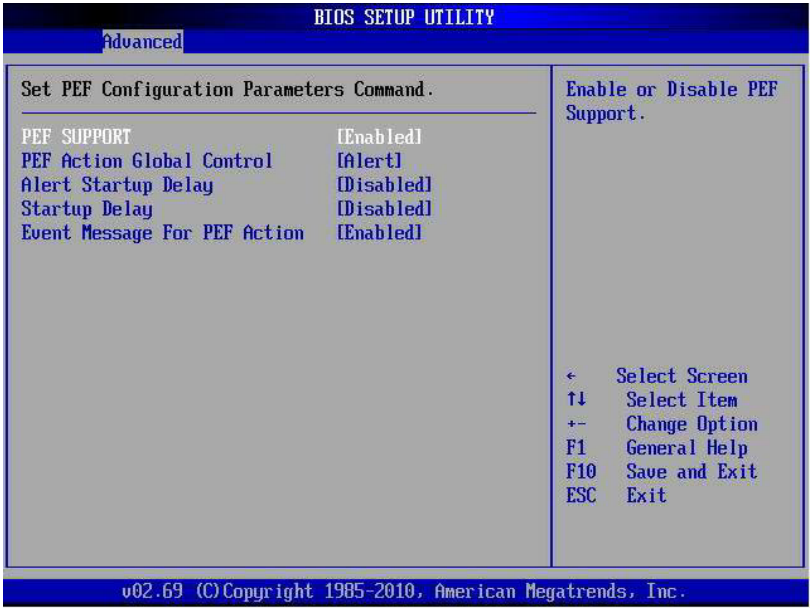
Feature	Option	Description
Set up LAN Configuration		
IP address source	**DHCP**	IPMI IP Address Source
	STATIC	
Save LAN Configuration	**[Enter]**	After setup LAN Configure need select Save LAN Configuration and choice 【ok】to enable changes.

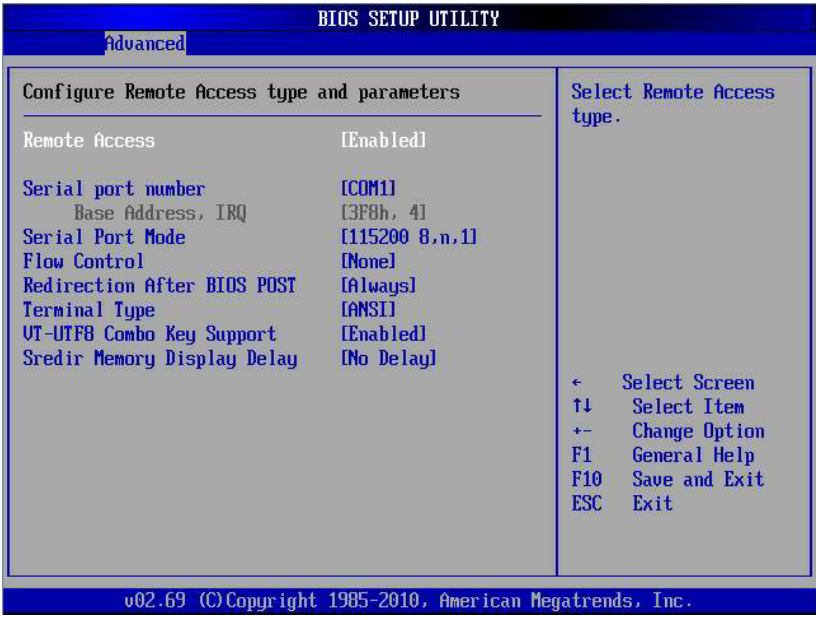
3.7.6.3 Set PEF Configuration Sub-Menu



Feature	Option	Description
Set PEF Configuration Parameters Command		
PEF Support	Disabled	Enable or Disable PEF Support
	Enabled	
PEF Action Global Control	**Alert**	Select action for PEF Action global control
	Power Down	
	Reset system	
	Power Cycle	
	OEM Action	
	Diagnostic Int	
Alert Startup Delay	**Disabled**	Enable or Disable Alert Startup Delay
	Enabled	
Startup Delay	**Disabled**	Enable or Disable Startup Delay
	Enabled	
Event Message For PEF Action	**Enabled**	Enable or Disable Event Msg Delay
	Disabled	

3.7.7- Remote Access Configuration Sub-Menu

You can use this screen to view the Remote Access Configuration Menu. This feature allows access to the Server remotely via serial port. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



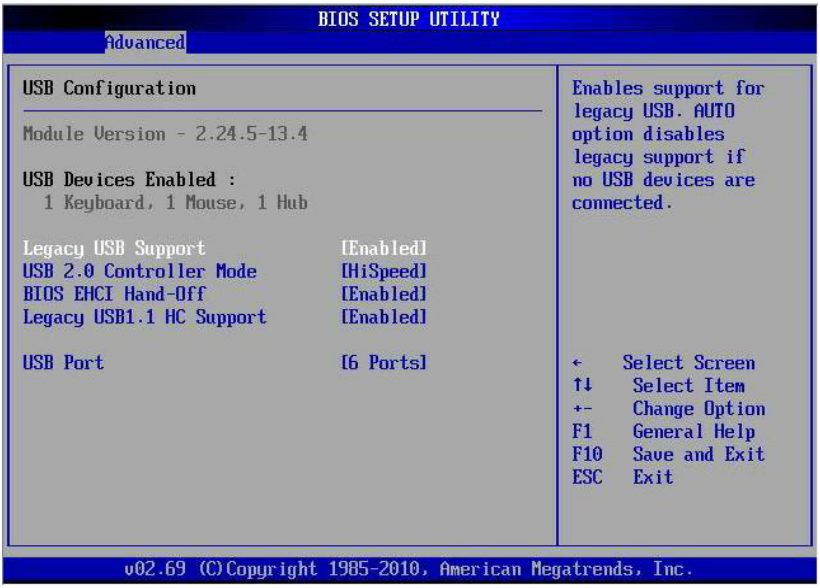
Feature	Option	Description
Configure Remote Access type and parameters		
Remote Access	Disabled	Select Remote Access type
	Enabled	

The following BIOS items are available only when ***Remote Access*** is set to **[Enabled].**

Feature	Option	Description
Configure Remote Access type and parameters		
Serial Port Number	**COM1**	Select Serial port for console Redirection. Make sure the selected port is enable COM 1—External COM COM 2---BMC COM for SOL
	COM2	
Serial Port Mode	**115200 8,n,1**	Select Serial Port settings.
	57600 8,n,1	
	38400 8,n,1	
	19200 8,n,1	
	09600 8,n,1	
Flow Control	**None**	Select Flow Control for console redirection.
	Hardware	
	Software	
Redirection After BIOS POST	**Always**	Redirection is always active. (Some Oss may not work if set to Always)
	Disabled	Turns off the redirection after POST Boot Loader.
	Boot Loader	Turns off the redirection after POST Boot Loader.
Terminal Type	**ANSI**	Select the target terminal type.
	VT100	
	VT-UTF8	
VT-UTF8 Combo Key Support	**Enabled**	Enable VT-UFT8 Combination Key Support for ANSI/VT100 terminals.
	Disabled	
Sredir Memory Display Delay	**No Delay**	Gives the delay in seconds to display memory information.
	Delay 1 Sec	
	Delay 2 Sec	
	Delay 4 Sec	

3.7.8 - USB Configuration Sub- Menu

You can use this screen to view the USB Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.


BIOS SETUP UTILITY
Advanced
USB Configuration
Module Version - 2.24.5-13.4
USB Devices Enabled :
1 Keyboard, 1 Mouse, 1 Hub
Legacy USB Support [Enabled]
USB 2.0 Controller Mode [HiSpeed]
BIOS EHCI Hand-Off [Enabled]
Legacy USB1.1 HC Support [Enabled]
USB Port [6 Ports]
Enables support for legacy USB. AUTO option disables legacy support if no USB devices are connected.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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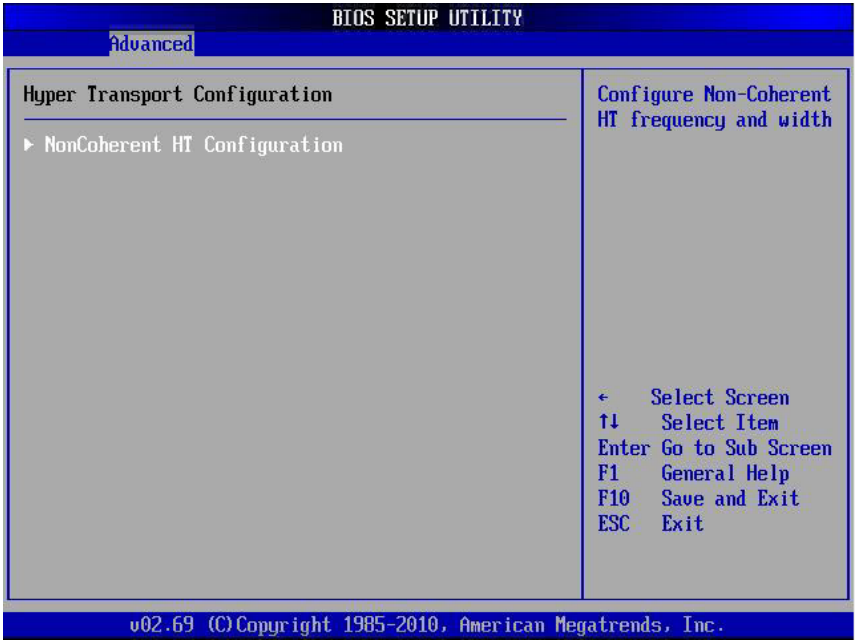
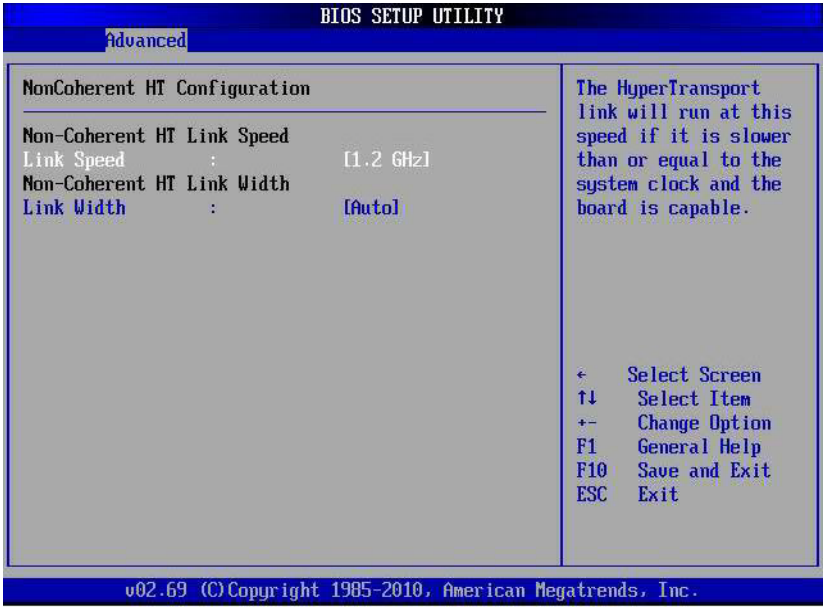
Feature	Option	Description
USB Configuration		
Legacy USB Support	Disabled	Enables support for legacy USB.AUTO option disables legacy support if no USB devices are connected.
	Enabled	
	AUTO	
USB 2.0 Controller Mode	**Hi Speed**	Configure the USB 2.0 controller in Hi Speed (480Mbps) or Full Speed (12Mbps).
	Full Speed	
BIOS EHCI Hand-Off	**Enabled**	This is a work around for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.
	Disabled	
Legacy USB1.1 HC Support	Disabled	Support USB1.1 HC
	Enabled	
	AUTO	
USB port	Disabled	Enable1//2/4/6 Ports in OS
	1 port	
	2 port	
	4port	
	6ports	

3.7.9 - Hyper Transport Configuration Sub-Menu

You can use this screen to view the Hyper Transport Configuration Menu. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option. The settings are described on the following pages.



3.7.9.1 – NonCoherent HT Configuration Sub-Menu


BIOS SETUP UTILITY
Advanced
NonCoherent HT Configuration
Non-Coherent HT Link Speed
Link Speed : [1.2 GHz]
Non-Coherent HT Link Width
Link Width : [Auto]
The HyperTransport link will run at this speed if it is slower than or equal to the system clock and the board is capable.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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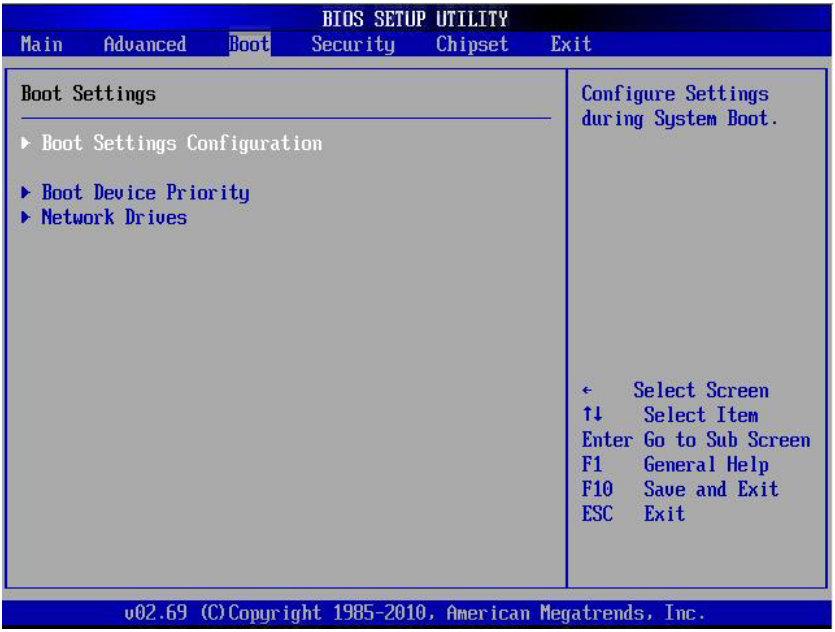
Feature	Option	Description
NonCoherent HT Configuration		
Non-Coherent HT Link Speed	Auto	The HyperTransport link will run at this speed if it is slower than or equal to the system clock and the board is capable.
	200~800Hz	
	1.2GHz	
	1.4GHz	
	1.6GHz	
	1.8GHz	
	2.0GHz	
	2.2GHz	
	2.4GHz	
	2.6GHz	
Non-Coherent HT Link Width	**Auto**	The HyperTransport link will run at this Width.
	4bit/8bit/16bit	

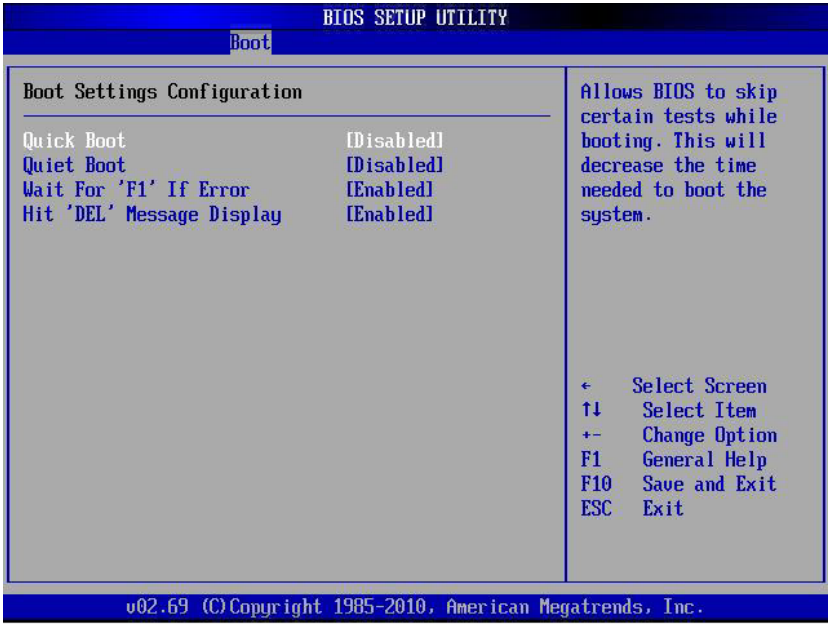
3.8 - Boot Menu

You can display Boot Setup option by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



3.8.1 - Boot Settings Configuration Sub-Menu

Use this screen to select options for the Boot Settings Configuration. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Disabled]
Quiet Boot [Disabled]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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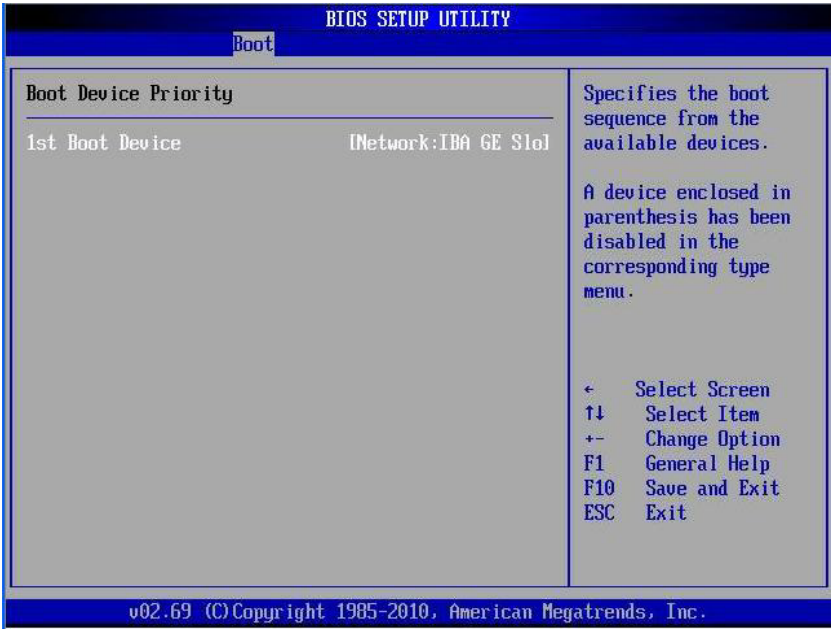
Feature	Option	Description
Boot Settings Configuration		
Quick Boot	Enabled	This option allows user bypass BIOS self test during POST.
	Disabled	
Quiet Boot	**Disabled**	Disabled: displays normal POST messages. Enabled: displays OEM log instead of POST messages.
	Enabled	
Wait for 'F1' If Error	**Enabled**	Waits for F1 key to be present if error occurs.
	Disabled	
Hit 'DEL' Message Display	**Enabled**	Displays "Press DEL to run Setup" in POST.
	Disabled	

3.8.2 - Boot Device Priority

Use this screen to select options for the Boot Device Priority. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.


BIOS SETUP UTILITY
Boot
Boot Device Priority
1st Boot Device
[Network:IBA GE Slo]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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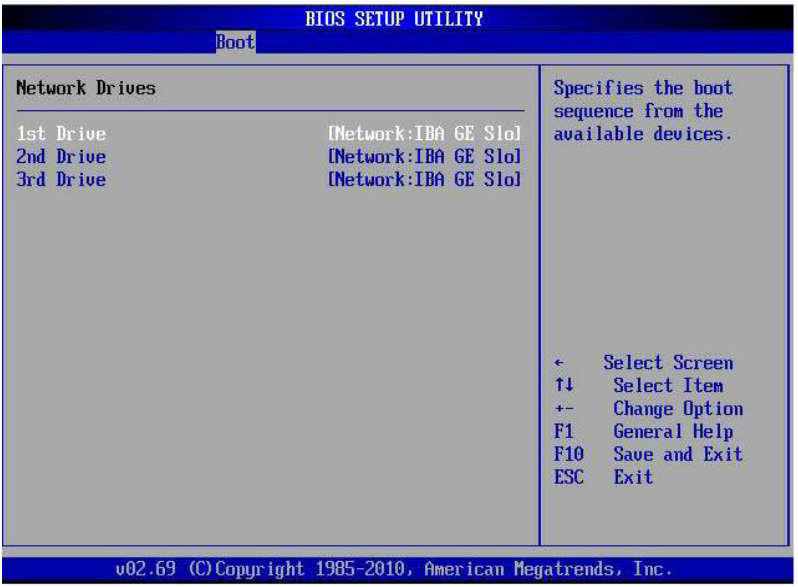
Feature	Option	Description
Boot Device Priority		
1st Boot Device	**Network: IBA GE Slot 0200 v1335**	Specifies the boot sequence from the available devices.
	Disabled	

3.8.3 - Network Drives

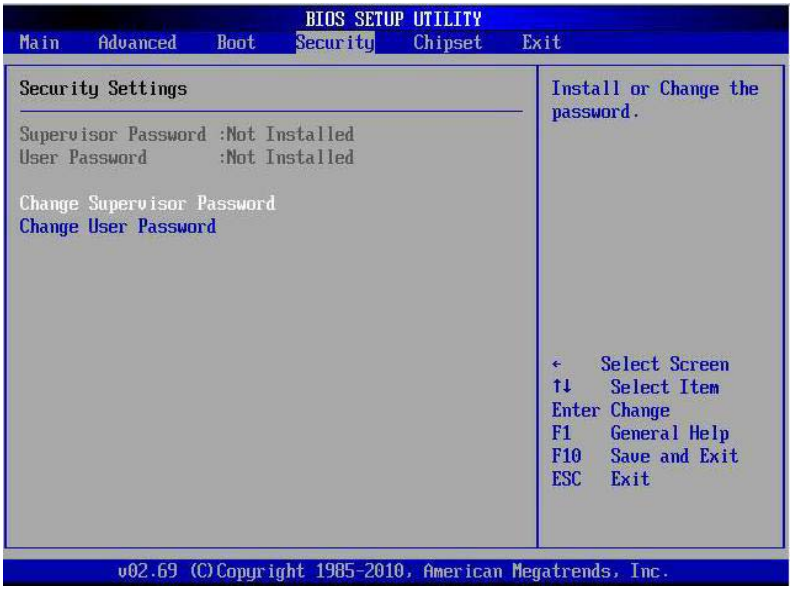
Use this screen to select options for the Network Drives. Use the up and down arrow (↑/↓) keys to select an item. Use the Plus and Minus (+/-) keys to change the value of the selected option.



Feature	Option	Description
Network Drives		
1st Drive	**Network: IBA GE Slot 0200 v1335**	Specifies the boot sequence from the available devices.
	Network: IBA GE Slot 0300 v1335	
	Network: IBA GE Slot 0301 v1335	
	Disabled	
2nd Drive	Network: IBA GE Slot 0200 v1335	Specifies the boot sequence from the available devices.
	Network: IBA GE Slot 0300 v1335	
	Network: IBA GE Slot 0301 v1335	
	Disabled	
3nd Drive	Network: IBA GE Slot 0200 v1335	Specifies the boot sequence from the available devices.
	Network: IBA GE Slot 0300 v1335	
	Network: IBA GE Slot 0301 v1335	
	Disabled	

3.9 - Security Menu

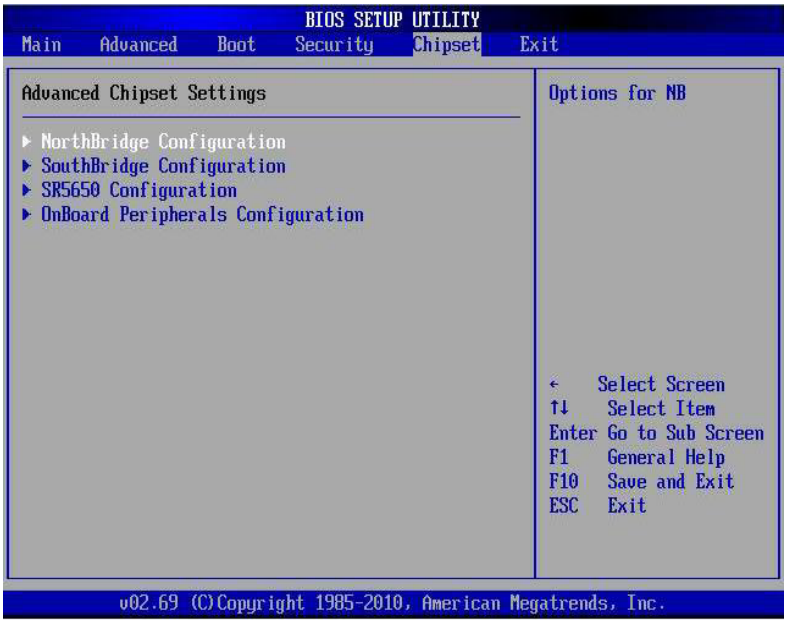
The system can be configured so that all users must enter a password every time the system boots or when BIOS Setup is entered, using either the Supervisor password or User password. The Supervisor and User passwords activate two different levels of password security. If you select password support, you are prompted for a one to six character password. Type the password on the keyboard. The password does not appear on the screen when typed. Make sure you write it down. If you forget it, you must clear CMOS and reconfigure.



Feature	Option	Description
Security Settings		
Supervisor Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
User Password:	**Not Installed**	If the password has been set, Installed displays. If no password is set, Not Installed displays.
	Installed	
Change Supervisor Password	[Enter]	Selects this option to change or install Supervisor Password.
Change User Password	[Enter]	Selects this option to change or install User Password.

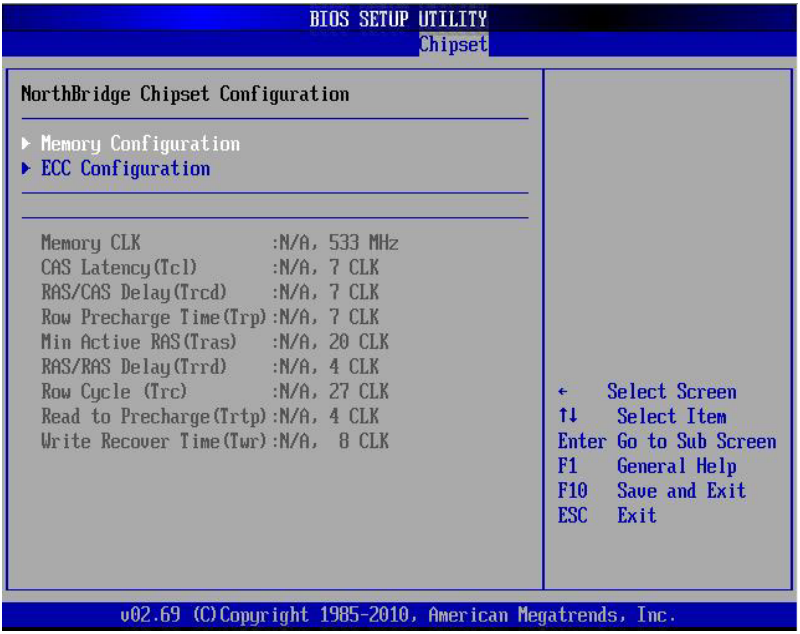
3.10 - Chipset Menu

This menu allows the user to customize functions of the AMD Chipsets. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.



3.10.1 – NorthBridge Chipset Configuration Sub- Menu

This menu gives options for Northbridge Chipset settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.


BIOS SETUP UTILITY
Chipset
NorthBridge Chipset Configuration
Memory Configuration
ECC Configuration
Memory CLK :N/A, 533 MHz
CAS Latency(Tcl) :N/A, 7 CLK
RAS/CAS Delay(Trcd) :N/A, 7 CLK
Row Precharge Time(Trp) :N/A, 7 CLK
Min Active RAS(Tras) :N/A, 20 CLK
RAS/RAS Delay(Trrd) :N/A, 4 CLK
Row Cycle (Trc) :N/A, 27 CLK
Read to Precharge(Trtp) :N/A, 4 CLK
Write Recover Time(Twr) :N/A, 8 CLK
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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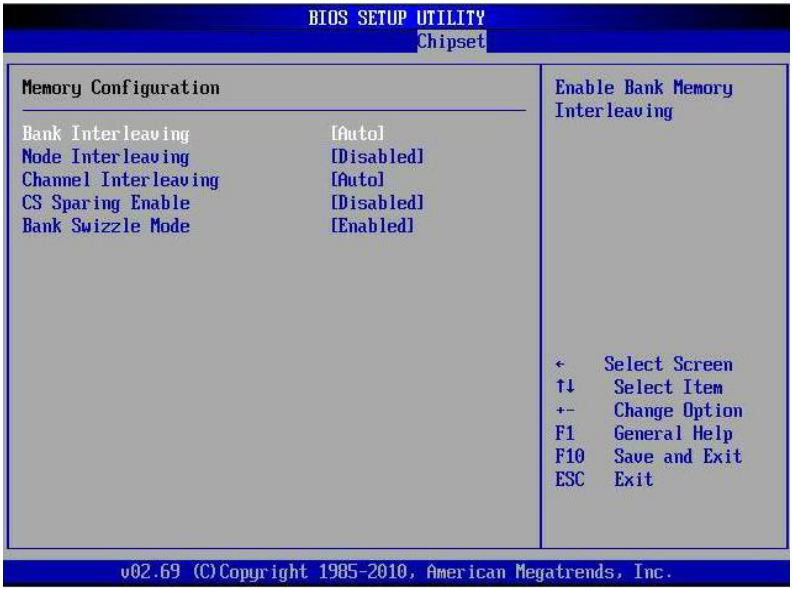
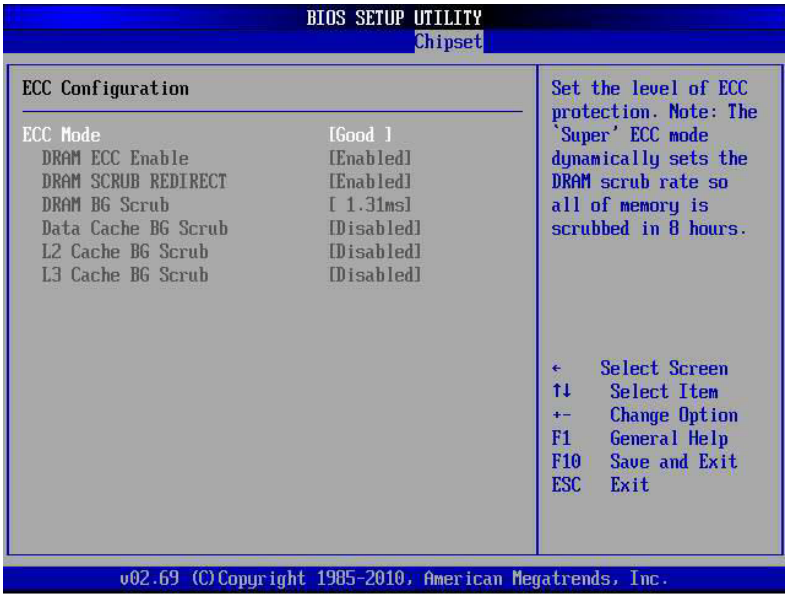
3.10.1.1 – Memory Configuration Sub- Menu



Feature	Option	Description
Memory Configuration		
Bank Interleaving	**Auto**	Bank Interleave setting has to do with the actual RAM chip properties, most good quality RAM chips have "4-bank interleaving" and work best at this setting. Inter-leaving controls how actual hits to memory takes place. Enable Bank Memory Interleaving
	Disabled	
Node Interleaving	Auto	Enable Node Memory Interleaving
	Disabled	
Channel Interleaving	**Auto**	Enable Channel Memory Interleaving
	Disabled	
CS Sparing Enable	**Disabled**	Reserve a spare memory rank in each mode
	Enabled	
Bank Swizzle Mode	Disabled	Enable or disable bank swizzle mode
	Enabled	

3.10.1.2 - ECC Configuration Sub-Menu


BIOS SETUP UTILITY
Chipset
ECC Configuration
ECC Mode [Good]
DRAM ECC Enable [Enabled]
DRAM SCRUB REDIRECT [Enabled]
DRAM BG Scrub [1.31ms]
Data Cache BG Scrub [Disabled]
L2 Cache BG Scrub [Disabled]
L3 Cache BG Scrub [Disabled]
Set the level of ECC protection. Note: The 'Super' ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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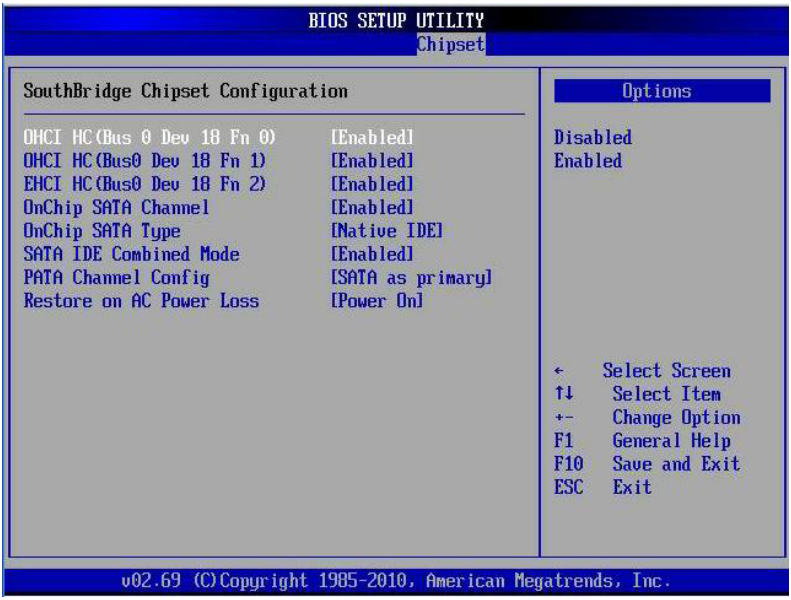
Feature	Option	Description
ECC Chipset Configuration		
ECC Mode	Disabled	Set the level of ECC protection. Note: The' super' ECC mode dynamically sets the DRAM scrub rate so all of memory is scrubbed in 8 hours.
	Basic	
	Good	
	Super	
	Max	
	user	
DRAM ECC Enable	**Enabled**	Only read
DRAM SCRUB REDIRECT	**Enabled**	
DRAM BG Scrub	**1.31ms**	
Data Cache BG Scrub	**Disabled**	
L2 Cache BG Scrub	**Disabled**	
L3 Cache BG Scrub	**Disabled**	

3.10.2 - Southbridge Configuration Sub-Menu

This menu gives options for Southbridge devices settings. Select a menu by highlighting it using the Arrow (↑/↓) keys and pressing Enter. The settings are described on the following pages.


BIOS SETUP UTILITY
Chipset
SouthBridge Chipset Configuration
OHCI HC(Bus 0 Dev 18 Fn 0) [Enabled]
OHCI HC(Bus0 Dev 18 Fn 1) [Enabled]
EHCI HC(Bus0 Dev 18 Fn 2) [Enabled]
OnChip SATA Channel [Enabled]
OnChip SATA Type [Native IDE]
SATA IDE Combined Mode [Enabled]
PATA Channel Config [SATA as primary]
Restore on AC Power Loss [Power On]
Options
Disabled
Enabled
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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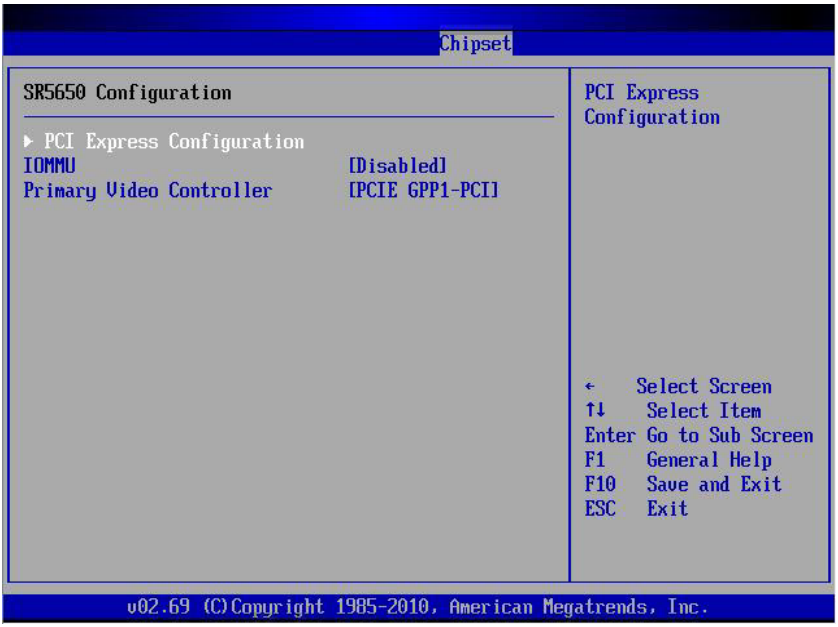
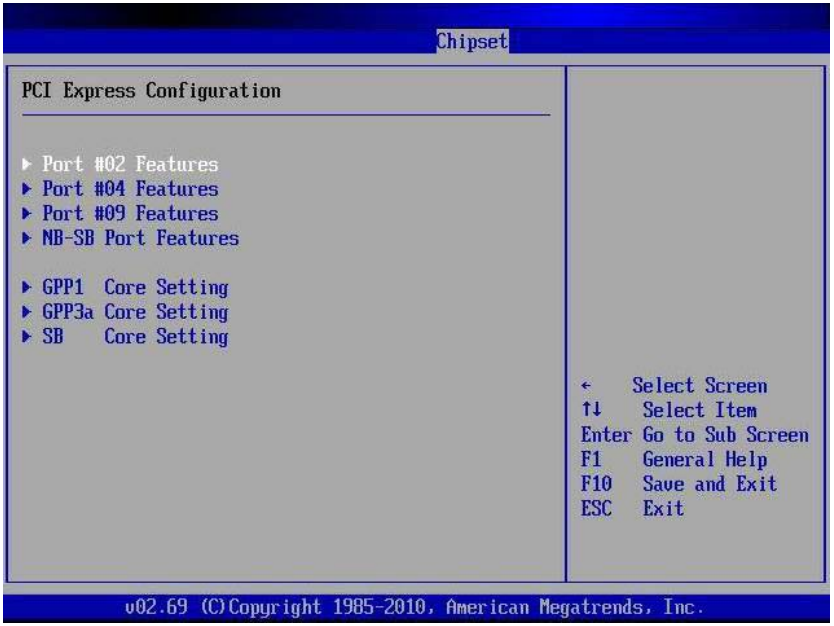
Feature	Option	Description
South Bridge Chipset Configuration		
OHCI HC(Bus 0 Dev 18 Fn 0)	Disabled	USB controller
	Enabled	
OHCI HC(Bus 0 Dev 18 Fn 1)	Disabled	
	Enabled	
EHCI HC(Bus 0 Dev 18 Fn 2)	Disabled	
	Enabled	
Onchip SATA Channel	Disabled	Enable or disable OnChip SATA channel.
	Enabled	
Onchip SATA Type	**Native IDE**	Select OnChip SATA type.
	RAID	
	AHCI	
	Legacy IDE	
SATA IDE Combined Mode	Disabled	Enable/Disable SATA IDE Combined Mode Disable combined mode if use SB700 SATA port 5 in AHCI or RAID Mode
	Enabled	
PATA Channel Config	**SATA as primary**	PATA Channel Config
	SATA as Secondary	
Restore on AC Power Loss	**Power On**	This one is the AC power sudden power failure shut down the computer. When the electricity came to shut down or when the computer is booting. The setting are off/on/last state.
	Power off	
	Last state	

3.10.3 – SR5650 Configuration Sub-Menu

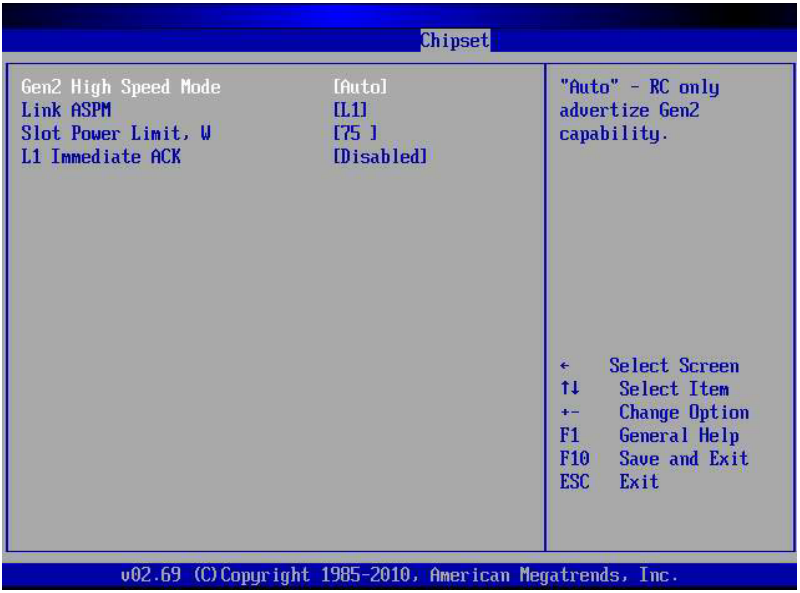


Feature	Option	Description
SR5650 Configuration		
IOMMU	**Disabled**	Disable or Enable IOMMU function.
	Enabled	
Primary Video Controller	**PCIE GPP1-PCI**	Video card scan from PCIE bus to PCI bus
	PCI-PCIE GPP1	Video card scan from PCI bus (onboard VGA) to PCIE bus.

3.10.3.1 – PCI Express Configuration Sub-Menu

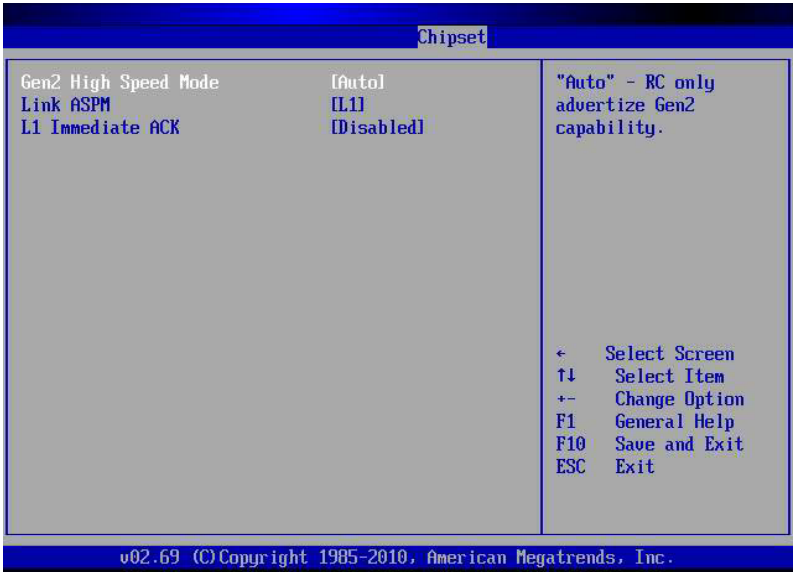


Port #02:



Feature	Option	Description
Port #02 Features		
Gen2 High Speed Mode	**Auto**	"Auto"-RC only advertize Gen2capability
	Disabled	
	Software Initiated	
	Advertised RC	
Link ASPM	Disabled	For ATI GFX Card: M2x-use ASPM L1 only M5x-use both ASPM L0
	L0s	
	L1	
	L0s & L1	
	L0s Downstream	
	L0sDownstream*L1	
Slot Power Limit, W	75	----
L1 Immediate ACK	**Disabled**	When Enabled L1 will be ACK'd immediately
	Enabled	

Port #04:

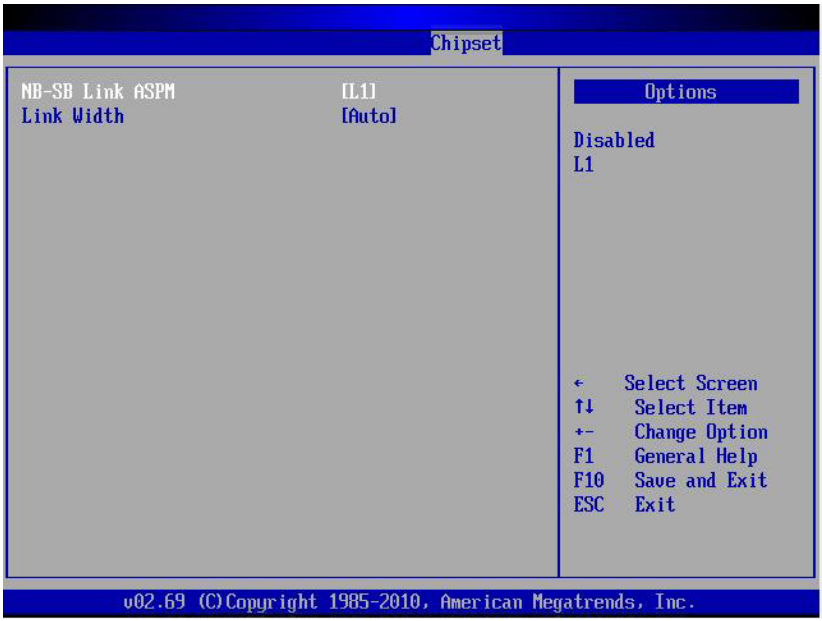


Feature	Option	Description
Port #04 Features		
Gen2 High Speed Mode	**Auto**	"Auto"- RC only advertize Gen2 capability
	Disabled	
	Software Initiated	
	Advertised RC	
Link ASPM	Disabled	For ATI GFXCard: M2x-use ASPM L1 only M5x-use both ASPM L0
	L0s	
	L1	
	L0s & L1	
	L0s Downstream	
	L0sDownstream*L1	
L1 Immediate ACK	**Disabled**	When Enabled L1 will be ACK'd immediately
	Enabled	

Port #09:

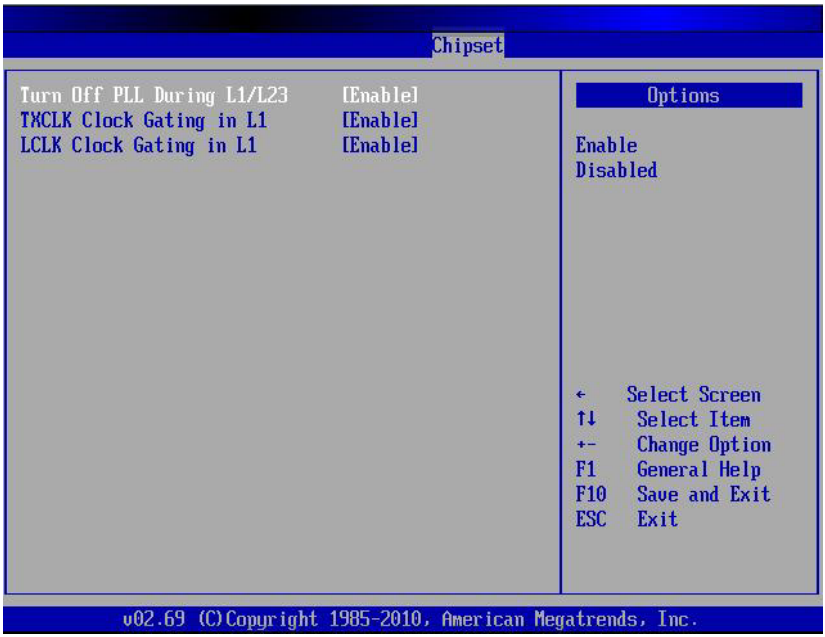
Feature	Option	Description
Port #09 Features		
Gen2 High Speed Mode	**Auto**	"Auto"-RC only Advertize Gen2 capability
	Disabled	
	Software Initiated	
	Advertised RC	
Link ASPM	Disabled	For ATI GFX Card: M2x-use ASPM L1 only M5x-use both ASPM L0
	L0s	
	L1	
	L0s & L1	
	L0s Downstream	
	L0sDownstream*L1	
L1 Immediate ACK	**Disabled**	When Enabled L1will be ACK'd immediately
	Enabled	

NB-SB Port:



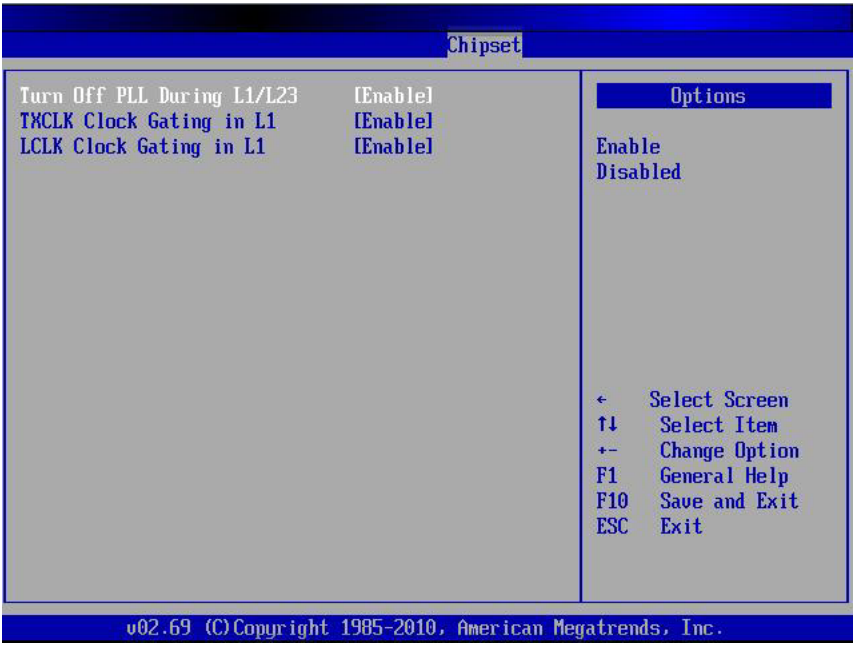
Feature	Option	Description
NB-SB Port Features		
NB-SB Link ASPM	Disabled	NB-SB Link ASPM
	L1	
Link Width	**Auto**	Select the Link Width
	x1/x2/x4	

GPP1 Core:



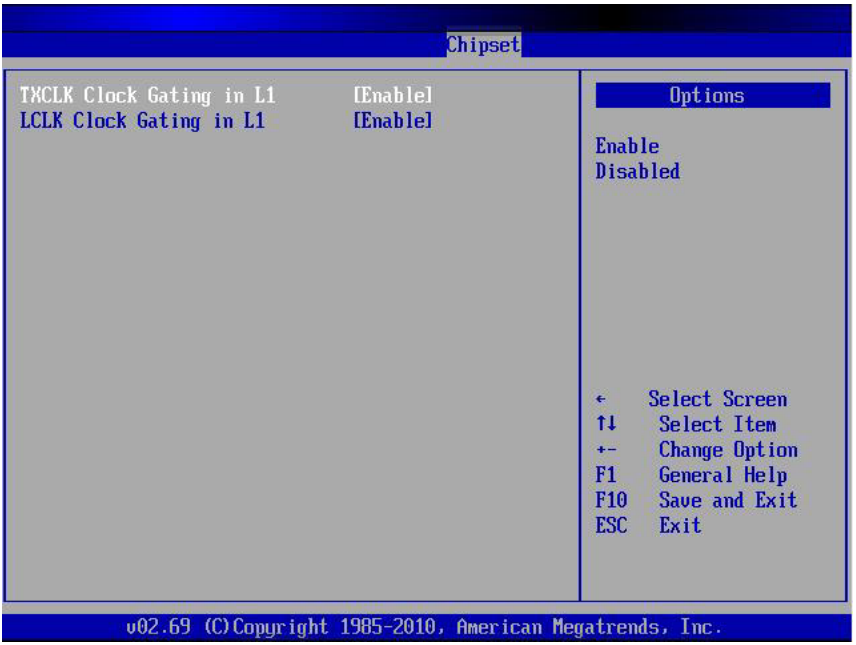
Feature	Option	Description
GPP1 Core		
Turn Off PLL During L1/L23	Disabled	-----
	Enable	
TXCLK Clock Gating in L1	Disabled	
	Enable	
LCLK Clock Gating in L1	Disabled	
	Enable	

GPP3a Core:



Feature	Option	Description
GPP3a Core		
Turn Off PLL During L1/L23	Disabled	-----
	Enable	
TXCLK Clock Gating in L1	Disabled	
	Enable	
LCLK Clock Gating in L1	Disabled	
	Enable	

SB Core：



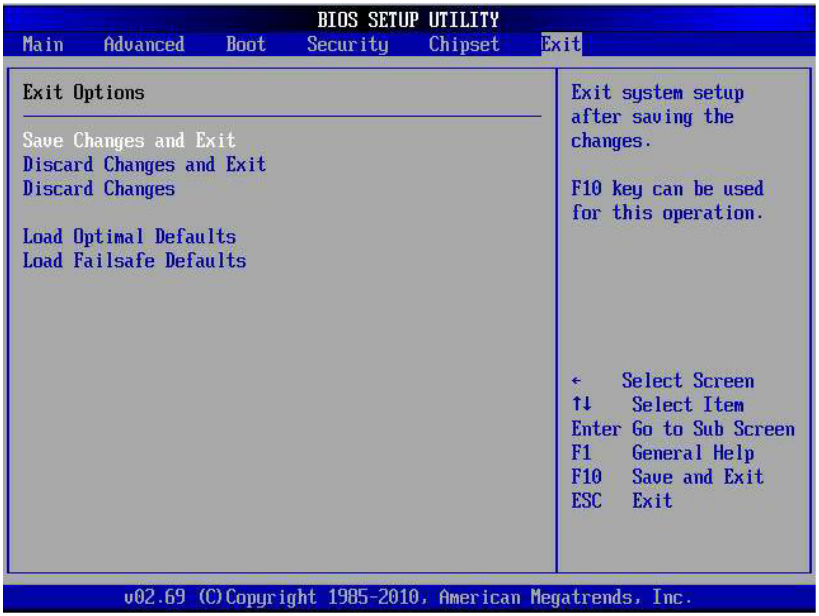
Feature	Option	Description
SB Core		
TXCLK Clock Gating in L1	Disabled	-----
	Enable	
LCLK Clock Gating in L1	Disabled	
	Enable	

3.10.4 – Onboard Peripherals Sub-Menu

Feature	Option	Description
Hyper Transport		
Onboard 82574 NIC	Disabled **Enabled with OPROM** Enabled without OPROM	Disable or Enable the onboard 82574 NIC with /without oprom.
Onboard 82576 NIC1	Disabled **Enabled with OPROM** Enabled without OPROM	Disable or Enable the onboard 82574 NIC1 with /without oprom.
Onboard 82576 NIC2	Disabled **Enabled with OPROM** Enabled without OPROM	Disable or Enable the onboard 82574 NIC2with /without oprom.

3.11 - Exit Menu

You can display an Exit BIOS Setup option by highlighting it Arrow (↑/↓) keys and pressing Enter.


BIOS SETUP UTILITY
Main Advanced Boot Security Chipset Exit
Exit Options
Save Changes and Exit
Discard Changes and Exit
Discard Changes
Load Optimal Defaults
Load Failsafe Defaults
Exit system setup after saving the changes.
F10 key can be used for this operation.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
v02.69 (C)Copyright 1985-2010, American Megatrends, Inc.

Save Changes and Exit

Use this option to exit setup utility and re-boot.
All new selections you have made are stored into CMOS.
System will use the new settings to boot up.

Discard Changes and Exit

Use this option to exit setup utility and re-boot.
All new selections you have made are not stored into CMOS.
System will use the old settings to boot up.

Discard Changes

Use this option to restore all new setup values that you have made but not saved into CMOS.

Load Optimal Defaults

Use this option to load default performance setup values.
Use this option when system CMOS values have been corrupted or modified incorrectly.

Load Failsafe Defaults

Use this option to load all default failsafe setup values.
Use this option when troubleshooting.

Chapter 4: Diagnostics

If you experience problems with setting up your system, always check the following things in the following order:

Memory, Video, CPU

By checking these items, you will most likely find out what the problem might have been when setting up your system. For more information on troubleshooting, check the TYAN® website at: http://**www.TYAN.com**.

4.1 - Beep Codes

Fatal errors, which halt the boot process, are communicated through two kinds of audible beeps.

- A single long beep followed by two short beeps: It indicates that a Video error has occurred.
- A single long beep repeatedly: It indicates that a DRAM error has occurred.The most common type of error is a memory error.

Before contacting your vendor or TYAN® Technical Support, be sure that you note as much as you can about the beep code length and order that you experience. Also, be ready with information regarding add-in cards, drives and O/S to speed the support process and come to a quicker solution.

4.2 - Flash Utility

Every BIOS file is unique for the motherboard it was designed for. For Flash Utilities, BIOS downloads, and information on how to properly use the Flash Utility with your motherboard, please check the TYAN® web site:

http://www.TYAN.com/

Please be aware that by flashing your BIOS, you agree that in the event of a BIOS flash failure, you must contact your dealer for a replacement BIOS. There are no exceptions. TYAN® does not have a policy for replacing BIOS chips directly with end users. In no event will TYAN® be held responsible for damages done by the end user.

4.3 - AMIBIOS Post Code

The POST code checkpoints are the largest set of checkpoints during the BIOS pre-boot process. The following table describes the type of checkpoints that may occur during the POST portion of the BIOS:

Checkpoint	Description
03	Disable NMI, Parity, video for EGA, and DMA controllers. Initialize BIOS, POST, Runtime data area. Also initialize BIOS modules on POST entry and GPNV area. Initialized CMOS as mentioned in the Kernel Variable "wCMOSFlags."
04	Check CMOS diagnostic byte to determine if battery power is OK and CMOS checksum is OK. Verify CMOS checksum manually by reading storage area. If the CMOS checksum is bad, update CMOS with power-on default values and clear passwords. Initialize status register A. Initializes data variables that are based on CMOS setup questions. Initializes both the 8259 compatible PICs in the system
05	Initializes the interrupt controlling hardware (generally PIC) and interrupt vector table.
06	Do R/W test to CH-2 count reg. Initialize CH-0 as system timer.Install the POSTINT1Ch handler. Enable IRQ-0 in PIC for system timer interrupt. Traps INT1Ch vector to "POSTINT1ChHandlerBlock."
08	Initializes the CPU. The BAT test is being done on KBC. Program the keyboard controller command byte is being done after Auto detection of KB/MS using AMI KB-5.
0A	Initializes the 8042 compatible Key Board Controller.
0B	Detects the presence of PS/2 mouse.
0C	Detects the presence of Keyboard in KBC port.
0E	Testing and initialization of different Input Devices. Also, update the Kernel Variables. Traps the INT09h vector, so that the POST INT09h handler gets control for IRQ1. Uncompress all available language, BIOS logo, and Silent logo modules.
13	Early POST initialization of chipset registers.
24	Uncompress and initialize any platform specific BIOS modules.
30	Initialize System Management Interrupt.
2A	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
2C	Initializes different devices. Detects and initializes the video adapter installed in the system that have optional ROMs.
2E	Initializes all the output devices.
31	Allocate memory for ADM module and uncompress it. Give control to ADM module for initialization. Initialize language and font modules for ADM. Activate ADM module.
33	Initializes the silent boot module. Set the window for displaying text information.
37	Displaying sign-on message, CPU information, setup key message, and any OEM specific information.

Checkpoint	Description
38	Initializes different devices through DIM. See *DIM Code Checkpoints* section of document for more information.
39	Initializes DMAC-1 & DMAC-2.
3A	Initialize RTC date/time.
3B	Test for total memory installed in the system. Also, Check for DEL or ESC keys to limit memory test. Display total memory in the system.
3C	Mid POST initialization of chipset registers.
40	Detect different devices (Parallel ports, serial ports, and coprocessor in CPU, … etc.) successfully installed in the system and update the BDA, EBDA…etc.
50	Programming the memory hole or any kind of implementation that needs an adjustment in system RAM size if needed.
52	Updates CMOS memory size from memory found in memory test. Allocates memory for Extended BIOS Data Area from base memory.
60	Initializes NUM-LOCK status and programs the KBD typematic rate.
75	Initialize Int-13 and prepare for IPL detection.
78	Initializes IPL devices controlled by BIOS and option ROMs.
7A	Initializes remaining option ROMs.
7C	Generate and write contents of ESCD in NVRam.
84	Log errors encountered during POST.
85	Display errors to the user and gets the user response for error.
87	Execute BIOS setup if needed / requested.
8C	Late POST initialization of chipset registers.
8E	Program the peripheral parameters. Enable/Disable NMI as selected
90	Late POST initialization of system management interrupt.
A0	Check boot password if installed.
A1	Clean-up work needed before booting to OS.
A2	Takes care of runtime image preparation for different BIOS modules. Fill the free area in F000h segment with 0FFh. Initializes the Microsoft IRQ Routing Table. Prepares the runtime language module. Disables the system configuration display if needed.
A4	Initialize runtime language module.
A7	Displays the system configuration screen if enabled. Initialize the CPU's before boot, which includes the programming of the MTRR's.
A8	Prepare CPU for OS boot including final MTRR values.
A9	Wait for user input at config display if needed.
AA	Uninstall POST INT1Ch vector and INT09h vector. Deinitializes the ADM module.
AB	Prepare BBS for Int 19 boot.
AC	End of POST initialization of chipset registers.
B1	Save system context for ACPI.
00	Passes control to OS Loader (typically INT19h).

NOTE

Glossary

ACPI (Advanced Configuration and Power Interface): a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

AGP (Accelerated Graphics Port): a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

ATAPI (AT Attachment Packet Interface): also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

ATX: the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

Bandwidth: refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

BBS (BIOS Boot Specification): a feature within the BIOS that creates, prioritizes, and maintains a list of all Initial Program Load (IPL) devices, and then stores that list in NVRAM. IPL devices have the ability to load and execute an OS, as well as provide the ability to return to the BIOS if the OS load process fails. At that point, the next IPL device is called upon to attempt loading of the OS.

BIOS (Basic Input/Output System): the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

Buffer: a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of

losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

Bus: a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

Bus mastering: allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

Cache: a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

Closed and open jumpers: jumpers and jumper pins are active when they are "on" or "closed", and inactive when they are "off" or "open".

CMOS (Complementary Metal-Oxide Semiconductors): chips that hold the basic startup information for the BIOS.

COM port: another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

DDR (Double Data Rate): a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

DIMM (Dual In-line Memory Module): faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

DIMM bank: sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

DMA (Direct Memory Access): channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

DRAM (Dynamic RAM): widely available, very affordable form of RAM which looses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

ECC (Error Correction Code or Error Checking and Correcting): allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they're found.

EEPROM (Electrically Erasable Programmable ROM): also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip. TYAN®'s BIOS updates can be found at http://**www.TYAN.com**

ESCD (Extended System Configuration Data): a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

Firmware: low-level software that controls the system hardware.

Form factor: an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

Global timer: onboard hardware timer, such as the Real-Time Clock (RTC).

HDD: stands for Hard Disk Drive, a type of fixed drive.

H-SYNC: controls the horizontal synchronization/properties of the monitor.

HyperTransport™: a high speed, low latency, scalable point-to-point link for interconnecting ICs on boards. It can be significantly faster than a PCI bus for an equivalent number of pins. It provides the bandwidth and flexibility critical for today's networking and computing platforms while retaining the fundamental programming model of PCI.

IC (Integrated Circuit): the formal name for the computer chip.

IDE (Integrated Device/Drive Electronics): a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

IDE INT (IDE Interrupt): a hardware interrupt signal that goes to the IDE.

I/O (Input/Output): the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

IRQ (Interrupt Request): an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

Latency: the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

NVRAM: ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

Parallel port: transmits the bits of a byte on eight different wires at the same time.

PCI (Peripheral Component Interconnect): a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

PCI PIO (PCI Programmable Input/Output) modes: the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.

PCI-to-PCI Bridge: allows you to connect multiple PCI devices onto one PCI slot.

Pipeline burst SRAM: a fast secondary cache. It is used as a secondary cache because SRAM is slower than SDRAM, but usually larger. Data is cached first to the faster primary cache, and then, when the primary cache is full, to the slower secondary cache.

PnP (Plug-n-Play): a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

PXE (Preboot Execution Environment): one of four components that together make up the Wired for Management 2.0 baseline specification. PXE was

designed to define a standard set of preboot protocol services within a client with the goal of allowing networked-based booting to boot using industry standard protocols.

RAID (Redundant Array of Independent Disks): a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

RAIDIOS: RAID I/O Steering (Intel)

RAM (Random Access Memory): technically refers to a type of memory where any byte can be accessed without touching the adjacent data and is often referred to the system's main memory. This memory is available to any program running on the computer.

ROM (Read-Only Memory): a storage chip which contains the BIOS; the basic instructions required to boot the computer and start up the operating system.

SDRAM (Synchronous Dynamic RAM): called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

Serial port: called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

SCSI Interrupt Steering Logic (SISL): Architecture that allows a RAID controller, such as AcceleRAID 150, 200 or 250, to implement RAID on a system board-embedded SCSI bus or a set of SCSI busses. SISL: SCSI Interrupt Steering Logic (LSI) (only on LSI SCSI boards)

Sleep/Suspend mode: in this mode, all devices except the CPU shut down.

SDRAM (Static RAM): unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

SLI (Scalable Link Interface): NVIDIA SLI technology links two graphics cards together to provide scalability and increased performance. NVIDIA SLI takes

advantage of the increased bandwidth of the PCI Express bus architecture, and features hardware and software innovations within NVIDIA GPUs (graphics processing units) and NVIDIA MCPs (media and communications processors). Depending on the application, NVIDIA SLI can deliver as much as two times the performance of a single GPU configuration.

Standby mode: in this mode, the video and hard drives shut down; all other devices continue to operate normally.

UltraDMA-33/66/100: a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

USB (Universal Serial Bus): a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

VGA (Video Graphics Array): the PC video display standard

V-SYNC: controls the vertical scanning properties of the monitor.

ZCR (Zero Channel RAID): PCI card that allows a RAID card to use the onboard SCSI chip, thus lowering cost of RAID solution

ZIF Socket (Zero Insertion Force socket): these sockets make it possible to insert CPUs without damaging the sensitive CPU pins. The CPU is lightly placed in an open ZIF socket, and a lever is pulled down. This shifts the processor over and down, guiding it into the board and locking it into place.

Technical Support

If a problem arises with your system, you should first turn to your dealer for direct support. Your system has most likely been configured or designed by them and they should have the best idea of what hardware and software your system contains. Hence, they should be of the most assistance for you. Furthermore, if you purchased your system from a dealer near you, take the system to them directly to have it serviced instead of attempting to do so yourself (which can have expensive consequences).

If these options are not available for you then TYAN® Computer Corporation can help. Besides designing innovative and quality products for over a decade, TYAN® has continuously offered customers service beyond their expectations. TYAN®'s website (**www.TYAN.com**) provides easy-to-access resources such as in-depth Linux Online Support sections with downloadable Linux drivers and comprehensive compatibility reports for chassis, memory and much more. With all these convenient resources just a few keystrokes away, users can easily find the latest software and operating system components to keep their systems running as powerful and productive as possible. TYAN® also ranks high for its commitment to fast and friendly customer support through email. By offering plenty of options for users, TYAN® serves multiple market segments with the industry's most competitive services to support them.

"TYAN's tech support is some of the most impressive we've seen, with great response time and exceptional organization in general"

----Anandtech.com

Help Resources:

1. See the beep codes section of this manual.
2. See the TYAN® website for FAQ's, bulletins, driver updates, and other information: **http://www.TYAN.com**
3. Contact your dealer for help BEFORE calling TYAN®.
4. Check the TYAN® user group:
   alt.comp.periphs.mainboard.TYAN

Returning Merchandise for Service

During the warranty period, contact your distributor or system vendor FIRST for any product problems. This warranty only covers normal customer use and does not cover damages incurred during shipping or failure due to the alteration, misuse, abuse, or improper maintenance of products.

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service can be rendered. You may obtain service by calling the manufacturer for a Return Merchandise Authorization (RMA) number.The RMA number Should be prominently displayed on the outside of the shipping carton and the package should be mailed prepaid. TYAN® will pay to have the board shipped back to you.

Notice for the USA

Compliance Information Statement (Declaration of Conformity Procedure) DoC

FCC Part 15: This device complies with part 15 of the FCC Rules

Operation is subject to the following conditions:

·This device must not cause harmful interference.

·This device must accept any interference received, including interference that may cause undesirable operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice for Canada

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la Classe A est conforme à la norme NMB-003 du Canada.

Notice for Europe (CE Mark)

This product is in conformity with the Council Directive 2004/108/EC.

CAUTION: Lithium battery included with this board. Do not puncture, mutilate, or dispose of battery in fire. There will be danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by manufacturer. Dispose of used battery according to manufacturer instructions and in accordance with your local regulations.